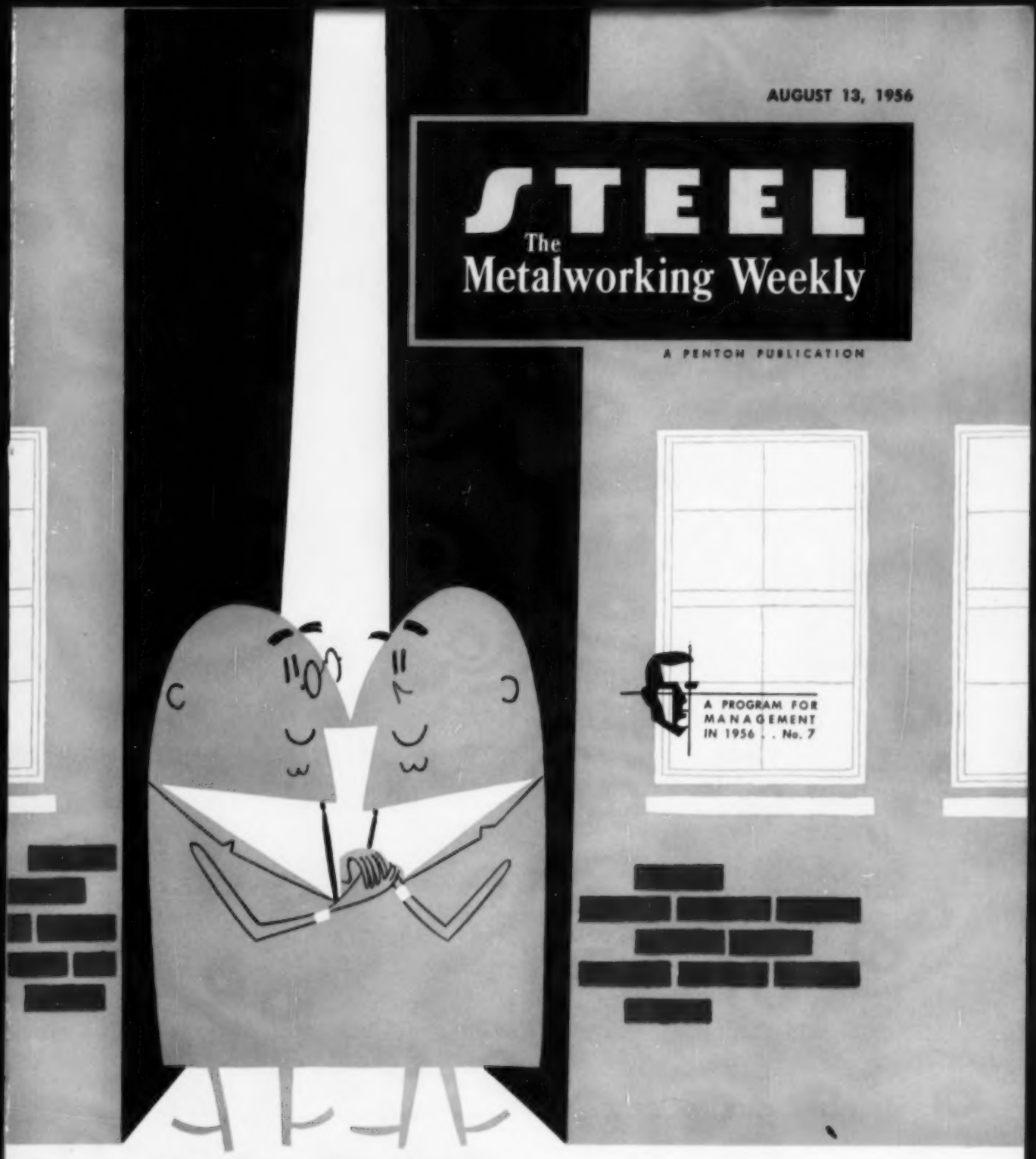
AUGUST 13, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



A PROGRAM FOR MANAGEMENT IN 1956 . . No. 7

The Case for Mergers

"Sudden growth" is big payoff . . . page 89

✔ Lead in Steel Forgings . . . page 100

✔ Stainless Steel: Where It Goes . . . page 139

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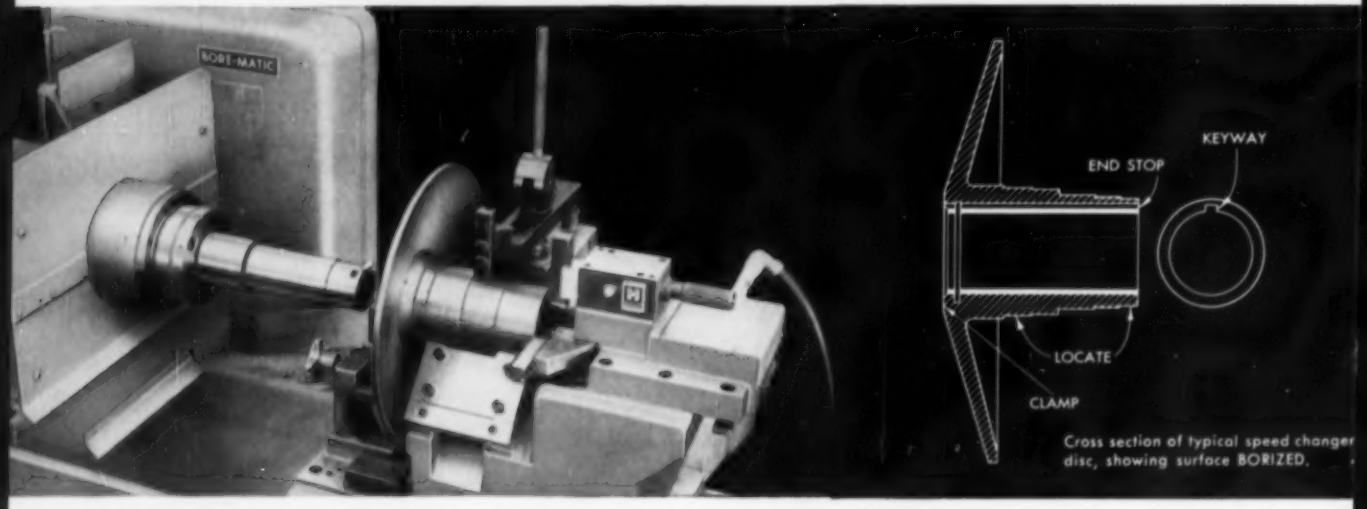
The extreme versatility of Heald **BORIZING*** permits faster precision finishing of both long-run jobs and small-lot work with frequent changeovers

FOR EXAMPLE: *This One Bore-Matic Finishes 41 Different Parts, with a production increase of over 200%!*



Cross section of typical speed changer disc, showing surface BORIZED.

The Model 221 Bore-Matic shown above is equipped with interchangeable tooling and adjustable fixture for precision boring 41 different speed changer discs, with bore diameters ranging from 0.688" to 3.2510" and bore lengths from 2⅜" to 9⅛". Compared to the previous method of doing the same job, BORIZING increased total net production from 4 parts to 13 parts per hour.

It PAYS to come to Heald

**BORIZING is a copyrighted word meaning the application of any number or variety of precision finishing operations performed on a Heald Bore-Matic.*

HEALD®

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

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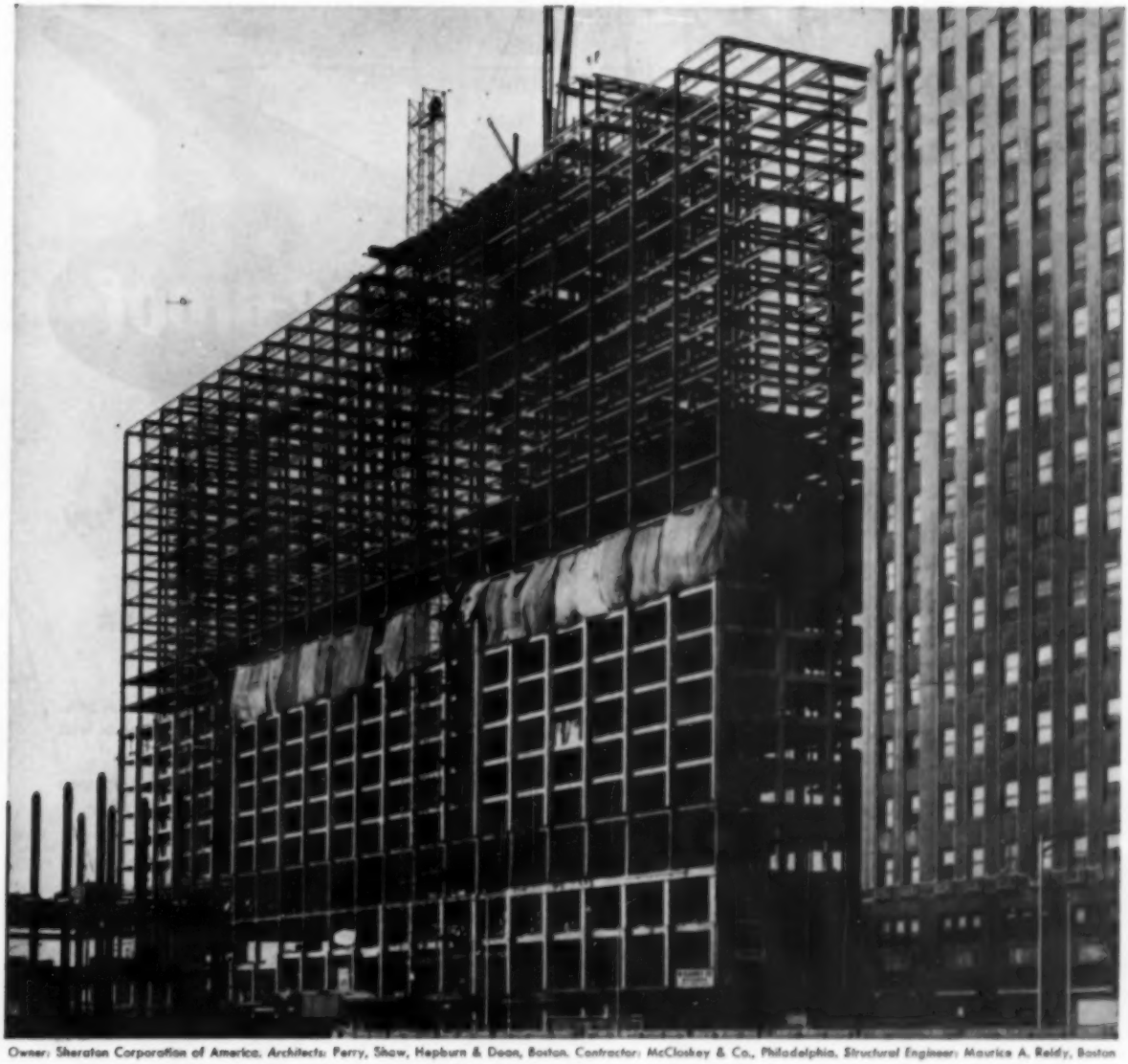


Owner: Sheraton Corporation of America. Architects: Perry, Shaw, Hepburn & Dean, Boston. Contractor: McCloskey & Co., Philadelphia. Structural Engineer: Maurice A. Reidy, Boston

First Building in Philadelphia Erected With High-Strength Bolts

Here, shown under construction, is the Sheraton Hotel the first multi-storied structure to be erected in Philadelphia by means of time-saving high-strength bolting. Bethlehem High-Strength Bolts connect the structural members of its 3900-ton framework.

The 21-story hotel is part of the Penn Center development in the heart of downtown Philadelphia. It has three floors of public rooms, 1000 guest rooms, and a top story of luxury suites with balconies, including a Presidential Suite.

Bethlehem High-Strength Bolts save time in steel erection because the joints can be made rapidly. In fact, a high-strength bolt, used with hardened washers, can be installed in seconds. While a holding wrench grasps the bolt-head, the nut is driven to predetermined tension with a calibrated pneumatic impact wrench. It's that simple!

Besides, with high-strength bolting, there's no fire hazard involved. And the bolting operation is less noisy than riveting, making it an ideal erection method for hospital and school zones.

Bethlehem High-Strength Bolts are made of carbon steel, and are heat-treated by quenching and tempering, to meet the requirements of ASTM Specification A-325. They are furnished in sizes to meet every construction need.

If you would like to have full information about erecting steelwork with Bethlehem High-Strength Bolts, please telephone the nearest Bethlehem sales office. Or write direct to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Crankshaft Machine Company uses La Salle's

NEW fatigue-proof STEEL BARS

to replace heat-treated alloy

- **140-150,000 PSI TENSILE**
- **MACHINES 50-100% FASTER**

FATIGUE-PROOF is specified in this automated turning machine manufactured by Crankshaft Machine Company, Jackson, Michigan.

This $60,000 machine uses FATIGUE-PROOF for a vital part. The rack that actuates the loading mechanism formerly was heat-treated alloy and is now FATIGUE-PROOF.

This is an automatic crankshaft turning machine that operates in automotive production lines. It must run dependably. The engine line can't wait for machine repairs.

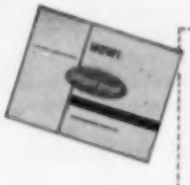
The rack itself is intricate and machining it was a problem. FATIGUE-PROOF solved that, and it did so at no risk to the machine!

If you are producing parts requiring tensile strengths in the 140,000 to 150,000 p.s.i. range . . if you are interested in a steel bar that has this strength without heat treating . . if you want to trim production costs with a bar that machines faster (25% faster than annealed alloys, 50% to 100% faster than heat-treated alloys) . . if you want to eliminate the cost and inconvenience of heat treating, we invite you to send us a blueprint or detailed description of your application or, better yet, pick up your telephone and call your nearest La Salle Sales Engineer.

TEST FATIGUE-PROOF! If it appears that FATIGUE-PROOF can help improve the quality of your product or cut your production costs, your La Salle Sales Engineer will be glad to furnish you with a sample bar for testing in your own plant.

NEWLY PUBLISHED!

Ask for your copy of this 20-page booklet which gives detailed information on the remarkable new FATIGUE-PROOF . . 29 pictures, tables, charts.



La Salle STEEL CO.
1414 150TH STREET, HAMMOND, INDIANA

Manufacturers of America's Most Complete Line of Quality Cold-Finished Steel Bars

LA SALLE STEEL CO.
1414 150th Street
Hammond, Indiana

Please send me your "FATIGUE-PROOF" Bulletin.

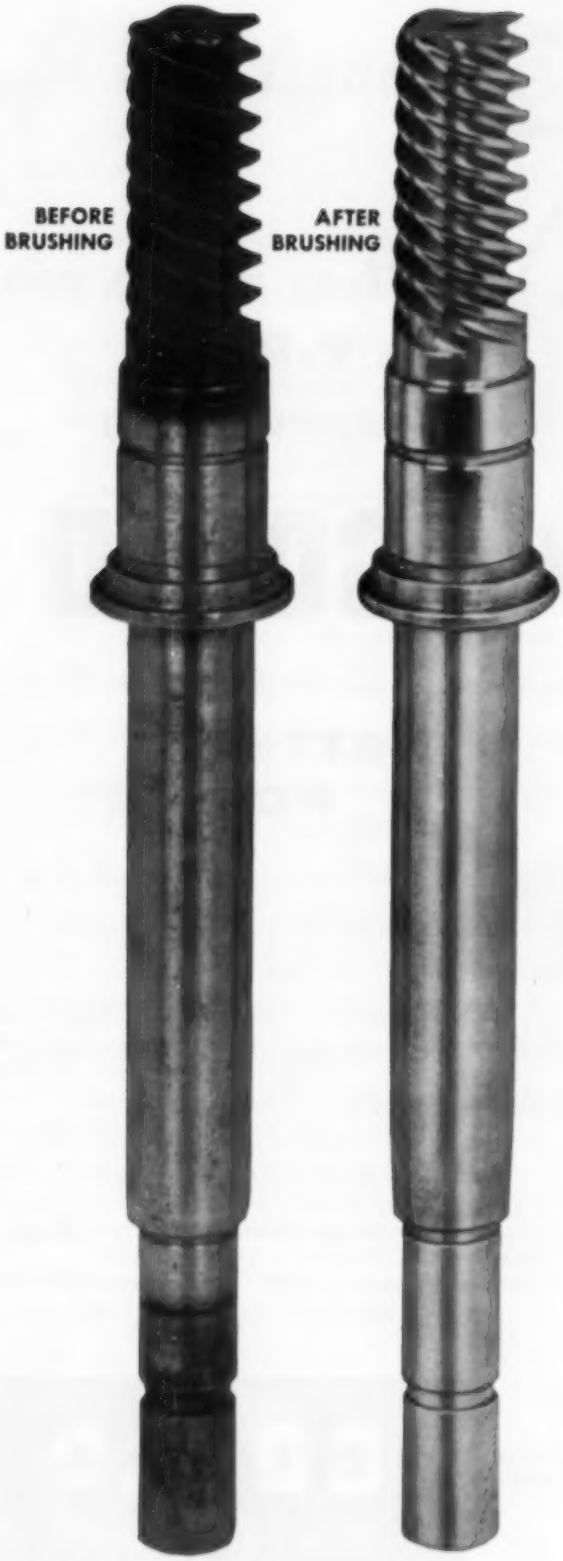
Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____



7 finished for the price of 1

COMPLEX business machines have as many as 25,000 moving parts. Although most of these parts must meet exceptionally high quality standards, production economy is also an imperative consideration.

Take the armature shaft shown on the left, as typical. Osborn Brushamatic® methods improve the finish of the worm gear from an original 30 down to 4 micro-inches, at ⅓ the cost of the former method. *Seven parts finished for the price of one.*

An **O**sborn **B**rushing **A**nalysis, made at no obligation to you, will point out how *you* can use Brushamatic finishing to achieve similar results and savings. Write *The Osborn Manufacturing Company, Dept. G-47, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Major manufacturer of business machines uses six different Osborn Brushamatic® 3-A machines to finish parts in lot quantities of 300 to several thousand.

Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

"They made me a V.P. for specifying

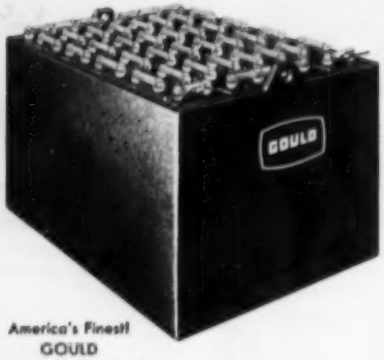
GOULD

Research-built

BATTERY POWER"

A healthy reward awaits *anyone* who chooses Gould battery power. Not only is battery power the most economical power you can buy, but Gould power gives you extra performance and extended service life possible only through years of basic and applied battery research.

Another reason for specifying Gould is Gould's Field Engineering Service. Covering all industrial centers in the nation, it's the finest in the industry . . . helps keep your batteries working at top capacity . . . adds months to their normal life. Get more power per dollar with Gould research-built battery power!



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Industrial Truck Batteries

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August 13, 1956 Vol. 139 No. 7

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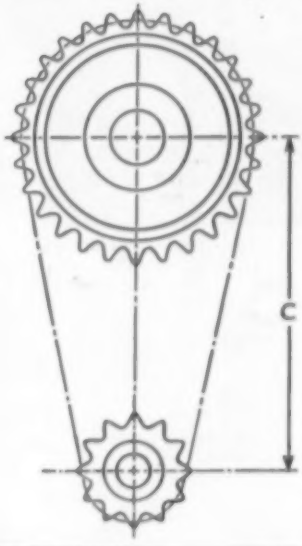
Designers!

Determine this Chain Length



GIVEN:

Teeth in small sprocket	17
Teeth in large sprocket	78
Center Distance	36"
Pitch of Chain	1"

To find — Chain length in inches.

(Answer below)

Acme Chains latest 76 page catalog brims with chain data. Filled with information on the correct and most efficient use of roller chain, cable chain and all types of sprockets. Among many other things it gives you the correct formula for computing proper chain lengths.

Answer: 122.12

FREE

76-page Catalog on application and use of Chains sent on written request. Write Dept.10D, Acme Chain Corp., Holyoke, Mass.

Acme Chain Corporation

℞ for Moisture-Hungry Stopper Rod Tile

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MORT-AIRSET

High Temperature Air-Setting Cement Assures High Moisture Retention . . . Guarantees Stronger, Tougher, Tighter Bond For Stopper Rods

Here's a refractory cement that retains it's original moisture content when applied to "moisture-hungry" tile . . . combines smooth workability with non-shrinking qualities to produce remarkably tight impenetrable joints throughout the complete temperature range to 3000° F.

Try this cement for bonding your stopper rod tile. Note for yourself it's excellent working, drying and non-shrinking properties that deliver easier application, better bond and longer service life. Guaranteed not to "gum up" or form lumps in the drum even after extended periods of storage.

Packed in 500 lb. and 200 lb. drums and smaller steel containers.

Write for literature.

Specialists in Refractories of High Bulk Density and Low Porosity

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101 FERRY ST. - ST. LOUIS 7, MO.
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behind the scenes

Urge To Merge

To merge or not to merge, that is the question. The story (page 89) on this modern dilemma—if you care to call it that—has received increasing attention from industrialists in recent years. The subject is well qualified to appear in STEEL's Program for Management series; indeed, it was so well qualified and documented, it crowded Copy Editor Harry Chandler right out of his office when it arrived for editing. The honest fellow simply stuffed the manuscript into a sack, and staggered off to the ninth floor conference room, where he spread the pages out on a table large enough to serve as a runway for a Piper Cub.

"You can't give a snap review of this particular article," said Mr. Chandler, absently mangling a heavy copy pencil between a set of formidable lateral bicuspids. "There are too many angles and facets about this merging business to warrant any generalizations. Why, it's a problem simply to *present* the problem!"

"Would you say, sir, that it boils down to a question of to merge or not to merge?"

"Trying to work in something along the lines of a soliloquy, by a man named Hamlet, eh?" he replied, skillfully evading the question. "Why don't you give up, and try straight reporting? Better yet, just give up."

It was too late. We had already outlined the thing:

Hamlet's Heirs May Sue

To merge or not to merge, that is the question: Whether 'tis foxier to contemplate the status quo and suffer the slings and arrows of outrageous anxiety, or to take arms against a sea of possibilities, and by merging, come out ahead? 'Tis a consummation devoutly to be wished. To sleep, to dream; to dream, perchance, of retaining a larger profit out of a smaller gross, or a smaller profit out of a larger gross. Aye, there's the rub! For 'tis in that period of indecision when the wheels keep going 'round that gives us pause. For who would willingly multiply the whips and scorns of adamant creditors, the proud customers' contumely, the pangs of despised sales pitches, the insolence of competition and the frown of directors when he himself might his quietus make with a bare declaration: "Deal me out, Jack, I'm going to mix some drinks."

Thus does indecision make cowards of us all; and thus the native hue of resolution is sicklied o'er—you know, the thought just occurred to us that maybe Chandler is right. Precipitously, then, exeunt Shrdlu.

Urge To Improve

The art of clarity in communication is practically a fetish with the editors of STEEL; clarity and brevity, and don't let this page fool you, either. Six months ago, Associate Managing Editor Vance Bell ripped the market section from a fresh copy of the magazine, tore it apart, reassembled it, pasted in new headings and dummied an entirely new section. Then he went into a huddle with Art Director Bill Kellogg over type selection and the placement of charts. He consulted with Production Manager Albert Anderson, concerning the tail end of the magazine, where market news, prices, last minute ads and the advertisers' index spread out into a sort of a delta.

"The market section," Vance declared, "required a little better organization. We jumped from steel prices, to scrap, back to steel, and were in constant danger of going off at a tangent and listing the price of cotton on the Egyptian exchange. So in the July 30 issue we put into effect our first changes: Bigger type, better headings, more logical arrangement, helpful charts. Believe me, you're going to see a lot of life in the market section from now on."

It's all true, too. That new 9 point type is going to be a heap easier on the eyes; sequence of material will follow naturally, and when you are treating yourself to a quick run down on, say, nonferrous prices, you won't be obliged to plow through a welter of Chicago steel scrap before you come back to zirconium. That reminds us: How has zirconium been doing lately?

Shrdlu

(Metalworking Outlook—Page 43)

B.F.Goodrich

3000-degrees hot but doors don't melt

A typical example of B. F. Goodrich improvement in rubber

THERE'S melted steel inside those big furnaces. Temperature is 3000 degrees. The heavy steel doors would melt in minutes except for that hose that carries a stream of cooling water in and out of them.

But hose was burning out in months or even weeks. It had to stand heat 24 hours a day, seven days a week, was often banged by big "charging machines," spattered with hot metal. Then B. F. Goodrich developed a new kind of hose made of wire, asbestos and rubber. It had been in use more than a year when the above picture was taken. It is less expensive than the hose used before, is much lighter and more flexible, easier for workmen to handle. One man can install it where two men were needed for other hose.

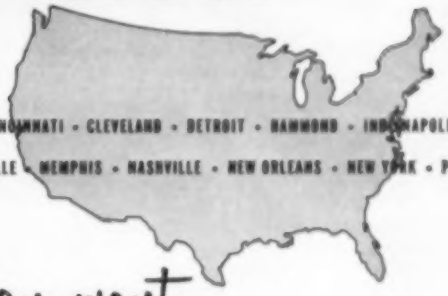
B. F. Goodrich has made hundreds of improvements in dozens of kinds of hose to make them last longer, cost less, save your time and money. Most improvements, while making the hose stand more abuse, have also made it more flexible and easier to handle. B. F. Goodrich makes hose to carry almost anything—air hose that stands sharp flying rocks outside and hot oil inside, burstproof steam hose that can't burst even if it wears out, hose that lasts for years carrying gasoline, paints, chemicals, even dry materials such as flour or cement.

Call your B. F. Goodrich distributor for more information about any kind of hose, belting or other rubber products. *B. F. Goodrich Industrial Products Company, Department M-724, Akron 18, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS

The Department Store of Steel



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the steel you want ...when you want it

Prompt delivery is but one of the many services offered by your J & L Warehouse . . .

Put our complete facilities to work for you—for example, take advantage of our large stocks of cold finished steel in a diversified range of sizes and analyses. Let us serve *all* your requirements for steel quickly and efficiently.

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The Department Store of Steel

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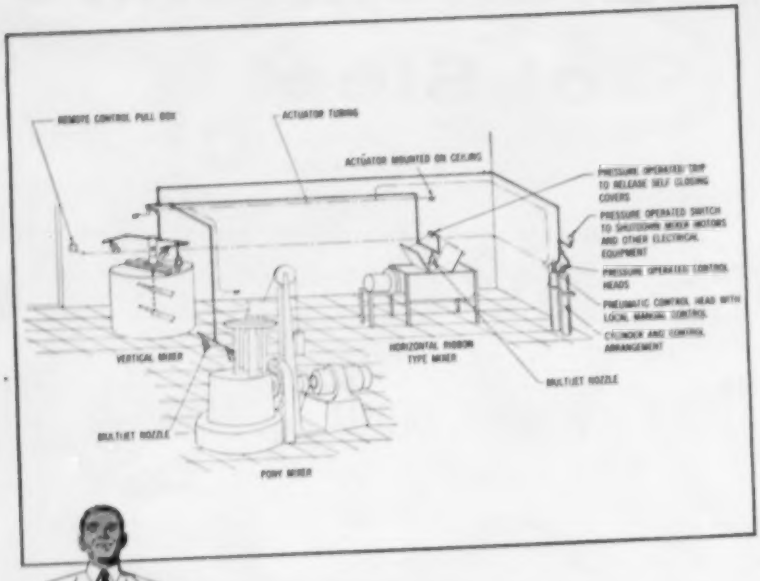
REMOTE CONTROL PULL BOX
ACTUATOR TUBING
ACTUATOR MOUNTED ON CEILING
PRESSURE OPERATED TRIP TO RELEASE SELF CLOSING COVERS
PRESSURE OPERATED SWITCH TO SHUTDOWN MIXER MOTORS AND OTHER ELECTRICAL EQUIPMENT
PRESSURE OPERATED CONTROL HEADS
PNEUMATIC CONTROL HEAD WITH LOCAL MANUAL CONTROL
CYLINDER AND CONTROL ARRANGEMENT
VERTICAL MIXER
HORIZONTAL RIBBON TYPE MIXER
MULTIJET NOZZLE
MULTIJET NOZZLE
PONY MIXER

FULL-TIME FIRE PROTECTION... CUSTOM-ENGINEERED FOR INDUSTRIAL MIXERS!

SPECIAL HAZARDS—like industrial mixing vats shown in the diagram above—deserve special fire protection . . . the *custom-engineered* kind of fire defense that you get with a Kidde CO_2 Fire Extinguishing System!

Fully automatic, the Kidde system provides *'round-the-clock* protection . . . insures full-time security even in case of outside power failures. Rate-of-temperature-rise detectors spot the first sign of flame, and cause Multijet nozzles to discharge fire-smothering carbon dioxide that stifles the blaze in seconds. At the same time, the Kidde system switches off fans and machinery and sounds an alarm.

All moving parts of a Kidde system are self-enclosed to prevent accidental discharge. Easy-to-read visual indicators show at a glance whether the system is "set" or "released." And Kidde Directional Valves let you guard more than one hazard from the same cylinder bank, providing completely versatile fire protection.

Don't settle for anything less than the *best* in fire protection. For more information about your specific problem, write Kidde today.

Kidde

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860 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd., Montreal—Toronto

LETTERS TO THE EDITORS

Wants Ten-Year Price Index

You give STEEL's finished steel price index in the market section each week. I would like to have the average index for ten years. We do not, of course, have issues that far back. In checking the *Statistical Abstract,* I find the government's figures in the latest issue only go through 1954.

Esther Block
Media Director
Bert S. Gittins Advertising
Milwaukee

• *These figures are found on page 160 of the insert, "1956 Metalworking Facts and Figures" (Jan. 2, 1956).*

What Does SUB Stand For?

What does SUB stand for? Your cover of July 16 has this word on it, and I've read through the article, "How To Live with SUB" (page 121). Perhaps my scrutiny wasn't close enough, but nowhere did I find SUB spelled out.

Although I infer the word has something to do with the Guaranteed Annual Wage, it is frustrating not to know exactly what SUB stands for. I suppose this is one of those abbreviations one is supposed to know. (Just like one is supposed to know where Webfoot street is when obtaining directions from a native in a small, unfamiliar town.)

My colleagues have suggested what SUB may mean. Some seem to be probably wide of the mark. Suggestions: SUBmarine, SUBway, Son-Uva-B, Substantial Union Benefits, Stabilized Union Benefits, Steel Union Benefits, Sensible Unemployment Bundle and others.

Won't you settle this acute indecision for me?

Charles L. Quittmeyer
Advisory Council on the Virginia Economy
Commonwealth of Virginia
Richmond, Va.

• *SUB means Supplemental Unemployment Benefits. The definition was given on page 120 in the column adjacent to the first page of the SUB story.*

Heat Resistant Paint

We are interested in the paint described in the item, "High Temperature Paint" in the Technical Outlook column of June 4 (page 101). It's based on a ceramic frit in a silicone resin and is good up to 1400°F. We would like to know whom to contact for more detailed information.

D. C. Wilson
Design Group Engineer
Materials & Processes
Convair
Division of General Dynamics Corp.
Ft. Worth, Tex.

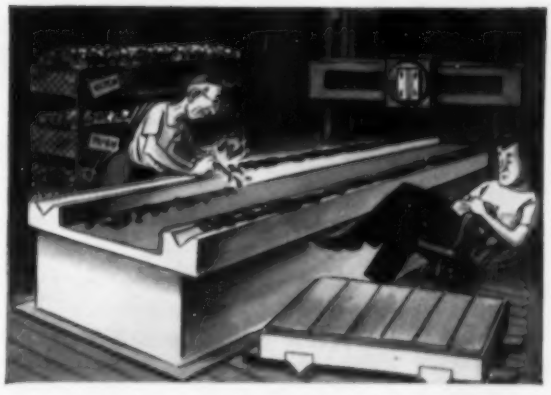
• *This item came from report PB 111957, "Development of Heat-Resistant Paints," by M. Kornbluth, Corps of Engineers, U. S. Army. It may be ordered*

(Please turn to page 12)

1. Cures "stick-slip" or "jumpy table". When a table gets the "shakes", especially after it has just reversed or when the load is heavy and the speed slow, it's probably suffering from "stick-slip". Remedy—Sunoco Way Lubricant®. Special polar compounds in Sunoco Way Lubricant form a friction-reducing film that keeps a table sliding smoothly under all operating conditions.

2. Doesn't squeeze out. When you use a heavy oil as a way lubricant, you must use a lot of oil to maintain a thick enough film. But, heavy oil squeezes out if the table sits in one position very long. You have a tough time getting the table moving again. Protected by the tenacious thin film formed by Sunoco Way Lubricant, the machine can be idle for a week and it will start easily.

WHY SUNOCO WAY LUBRICANT CAN HELP CURE YOUR MACHINING PROBLEMS



3. Protects expensive ways. Badly scored or pitted ways, caused by inadequate way lubrication, result in lost production and expensive repairs. The high film strength of Sunoco Way Lubricant eliminates the danger of metal-to-metal contact, the chief cause of scoring and way wear. Excellent metal-wetting and non-corrosive properties eliminate rusting and pitting.

For the lubrication of slides
and ways on this machine,
we recommend the use of
SUNOCO WAY LUBRICANT
a product of
SUN OIL COMPANY

4. Approved by more than 55 machine-tool builders. Every major machine-tool builder has tested Sunoco Way Lubricant. It is always approved. In fact, to assure maximum efficiency of their product, many manufacturers ship a supply of Sunoco Way Lubricant with each machine. We'll be glad to send you the list of manufacturers who have approved Sunoco Way Lubricant.

For more information, see your Sun Representative, or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-8.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

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*A complete line from Twin Disc—the world's largest manufacturer of friction and fluid drives for industrial powered equipment—means unbiased recommendations on which drive is best suited to solve your particular problems. Friction for applications from fractional to 1050 hp—Fluid for applications from ½ to 1,000 hp. Twin Disc Clutch Company, Racine, Wis., Hydraulic Division, Rockford, Ill.

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LETTERS

(Concluded from page 10)

from OTS, U. S. Department of Commerce, Washington 25, D. C. The price is $4.

Cost-Conscious Members

I have just read a reprint of your excellent article, "Know Your Costs," (Mar. 19, page 83).

The National Accounting & Finance Council is made up of 700 accountants, controllers and treasurers of the trucking industry. I am sure this article would be of interest and value to our members who are becoming more "cost-conscious" every day.

We would appreciate 700 reprints for distribution to our members.

Walton Nichols
Secretary
National Accounting & Finance Council
American Trucking Associations Inc.
Washington

Wire Story To Go to Staff

I would appreciate receiving six copies of the article, "Save with Shaped Wire" (July 16, page 132), for distribution to our people.

H. R. Wimmersberger
Vice President
Pittsburgh Tool Steel Wire Co.
Monaca, Pa.

Series Termed 'Noteworthy'

We find the series of articles, "Lubrication in Drawing" Parts I, II, and III which appeared in the issues of July 9 (page 86), July 16 (page 148) and July 23 (page 94) to be noteworthy. We would like to supply our metal processing department sales force with copies. Please send 40 reprints.

Joseph F. Santilli Jr.
Assistant Advertising Manager
Pennsylvania Salt Mfg. Co.
Philadelphia

We would like to distribute 50 reprints of this article to our sales representatives.

C. F. Scarratt
Assistant to the President
Apollo Metal Works
Chicago

Request from Japan Answered

In the section following the Market Outlook column in STEEL, you publish "Average Prices of Steel" with a note that readers may obtain a complete description of the listed products and extras and deductions applicable to them by writing to you. Please be kind enough to send us lists of mill base prices and typical extras and deductions.

Michio Shiota
Director
Kozai Club Jimukyoku
Tokyo, Japan

• *We are sending you a description of the extras or deductions which apply to steel products on which the U. S. Bureau of Labor Statistics reports average prices. The base prices are those quoted in* STEEL. *To these are added the extras for qualities and quantities as described in the material being mailed to you. The extras are obtained from quotations in extra books issued by the steel producers. The extra books on all of the products for just one company comprise a sizable volume.*

BLAW-KNOX *makes what it takes*

for continuous, mechanical chipping

The Continental Chipper with auxiliary equipment is a complete mechanical system for sorting, handling, inspecting and chipping billets. This integrated system has demonstrated in-service cost savings over manual conditioning. It represents a wise investment in long range modernization programs for conditioning for subsequent rolling in merchant and bar mill operations.

Product quality improvement is immediate, positive. Precise chipping is accomplished by a non-traveling cutter head under which the billet moves in a fashion similar to a milling machine. All chipping is done at close range, immediately in front of the operator. This single operator, located in front of the cutter head controls the entire operation including all material handling.

The chipper is equipped with special interlocking devices which eliminate unsafe operation. Usual chipping bay hazards such as high pressure air lines, improperly handled chisels, and flying chips are removed. The Continental Chipper accommodates billets up to 30 feet in all merchant and bar mill sizes.

For complete details, write for illustrated booklet.

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1

TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF

2

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Steel and Tubes Division

BURLINGTON, NEW JERSEY

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HIGH TEMPERATURE

SOUNDNESS AT 2150° F.

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

SURFACE AT 1400° F.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

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SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	5" to 50"
Wall Thickness	½" and up
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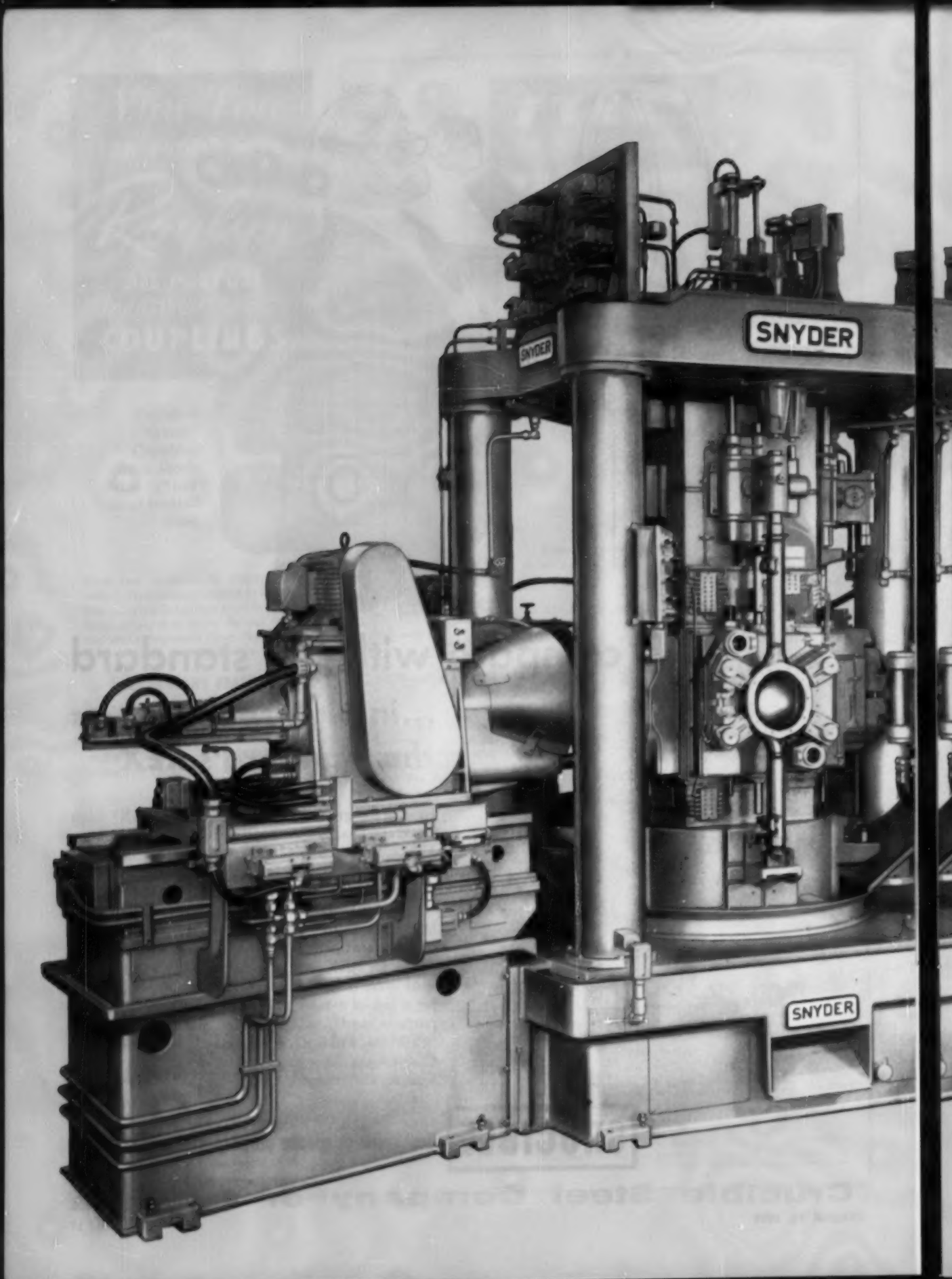
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Well-planned safety and fire prevention programs are doing their share to protect lives, property and production schedules at the Great Lakes Corporation, Detroit, Mich., division of National Steel Corporation. Ansul fire extinguishers are playing a part in this successful program.

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CALENDAR
OF MEETINGS

Aug. 21-24, Western Electronic Show and Convention: Pan Pacific Auditorium and Ambassador hotel, Los Angeles. Information: Wescon, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Sept. 7-9, Metal Powder Association: Fall meeting, Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

Sept. 9-13, American Institute of Chemical Engineers: Fall meeting, William Penn hotel, Pittsburgh. Institute's address: 120 E. 41st St., New York 17, N. Y. Secretary: F. J. Van Antwerpen.

Sept. 9-12, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N. J. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

Sept. 10-12, Allied Railway Supply Association: Annual meeting, Sherman hotel, Chicago. Association's address: 1200 W. Chase Ave., Chicago 26, Ill. Executive secretary: Charles F. Weil.

Sept. 10-12, American Society of Mechanical Engineers: Fall meeting, Cosmopolitan hotel, Denver. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.

Sept. 10-12, Packaging Institute: Annual forum, Hotel Statler, Cleveland. Institute's address: 343 Madison Ave., New York 17, N. Y. Executive director: Charles A. Feld.

Sept. 10-13, Society of Automotive Engineers Inc.: National tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Sept. 11-13, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 11-14, Packaging Machinery Manufacturers Institute: Packaging machinery and material exposition. Public Auditorium, Cleveland. Information: Hanson & Shea Inc., One Gateway Center, Pittsburgh 22, Pa.

Sept. 12-14, Porcelain Enamel Institute: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Institute's address: 1145 19th St. N. W., Washington 6, D. C. Secretary: John C. Oliver.

Sept. 16-20, American Society of Sanitary Engineering: Annual meeting, Morrison hotel, Chicago. Society's address: 4716 Ewing Ave. S., Minneapolis. Secretary: Walter A. Dunn.

Sept. 16-21, American Chemical Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N. W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 17-21, American Society for Testing Materials: Pacific area national meeting and apparatus exhibit, Hotel Statler, Los Angeles. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Sept. 17-21, Instrument Society of America: Annual instrument-automation conference and exhibit, Coliseum, New York. Society's address: 1319 Allegheny Ave., Pittsburgh 33, Pa. Executive director: William H. Kushnick.

Sept. 20-21, American Hot Dip Galvanizers Association: Semiannual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

Sept. 24-25 Steel Founders' Society of America: Fall meeting, Greenbrier, White Sulphur Springs, W. Va. Society's address: 606 Terminal Tower, Cleveland 13, O. Executive vice president: F. Kermit Donaldson.

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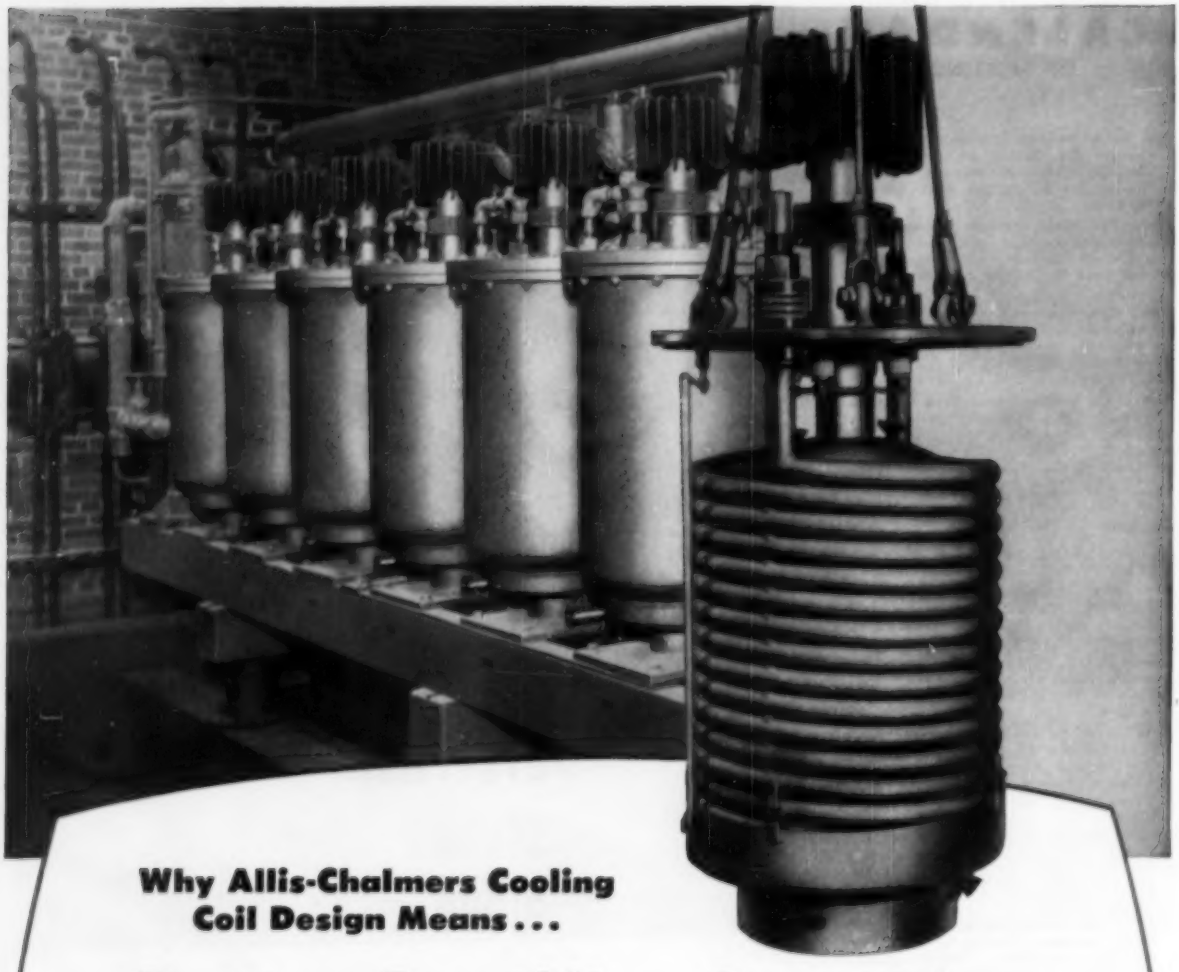

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Better Rectifier Operation

More Efficient Heat Transfer results from internal cooling coil. The steel coil surrounds active parts, offering more cooling surface and better heat transfer than other types. Unit maintains more uniform temperature and mercury vapor pressure.

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Positive Arc Barrier is formed by the cooling coil, which is insulated from the tank. The main arc is confined within the coil, preventing arc transfer to the tank.

Years of Operation in hundreds of installations have proved the reliability, ease of operation, and simplified maintenance of Allis-Chalmers mercury arc rectifiers. You can get complete information at your nearby A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

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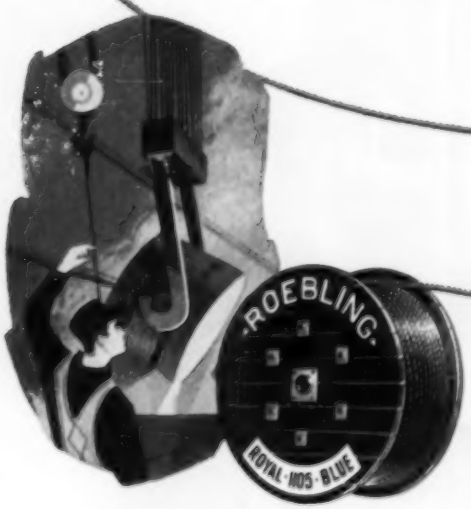
Royal Blue rope is made of the *toughest* rope wire ever developed... Roebling Type 1105



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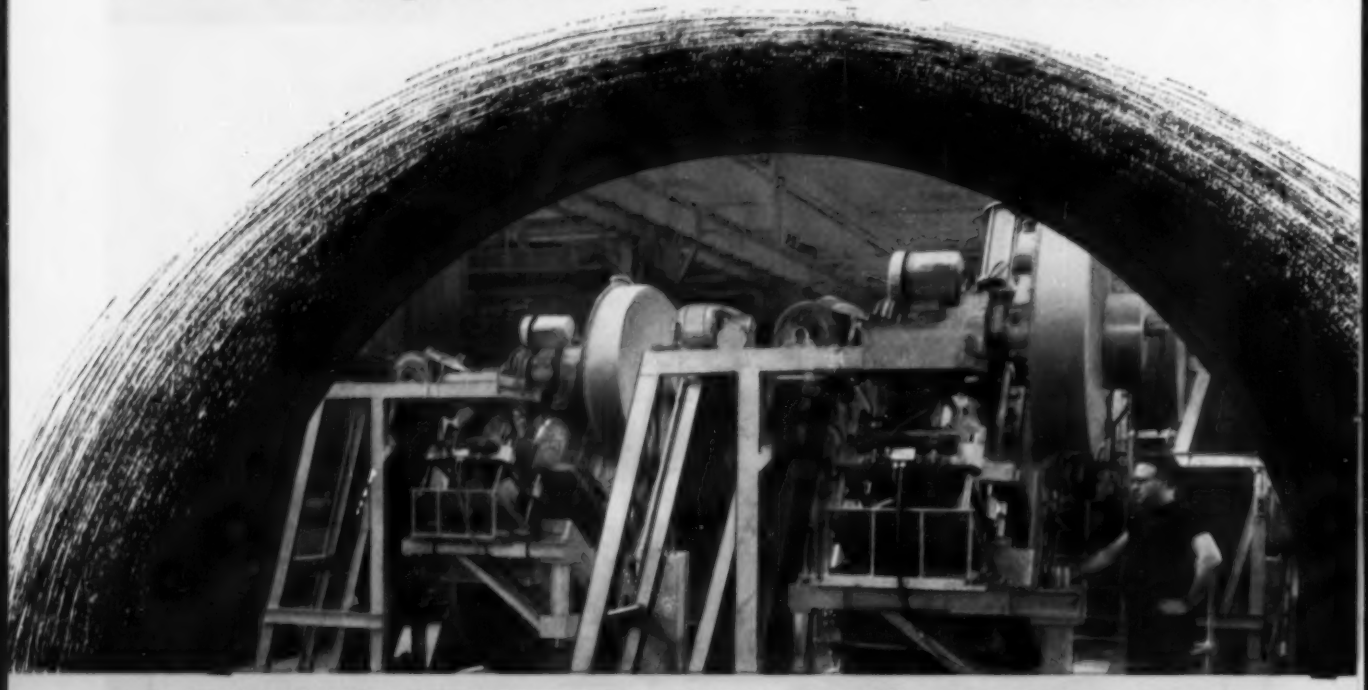
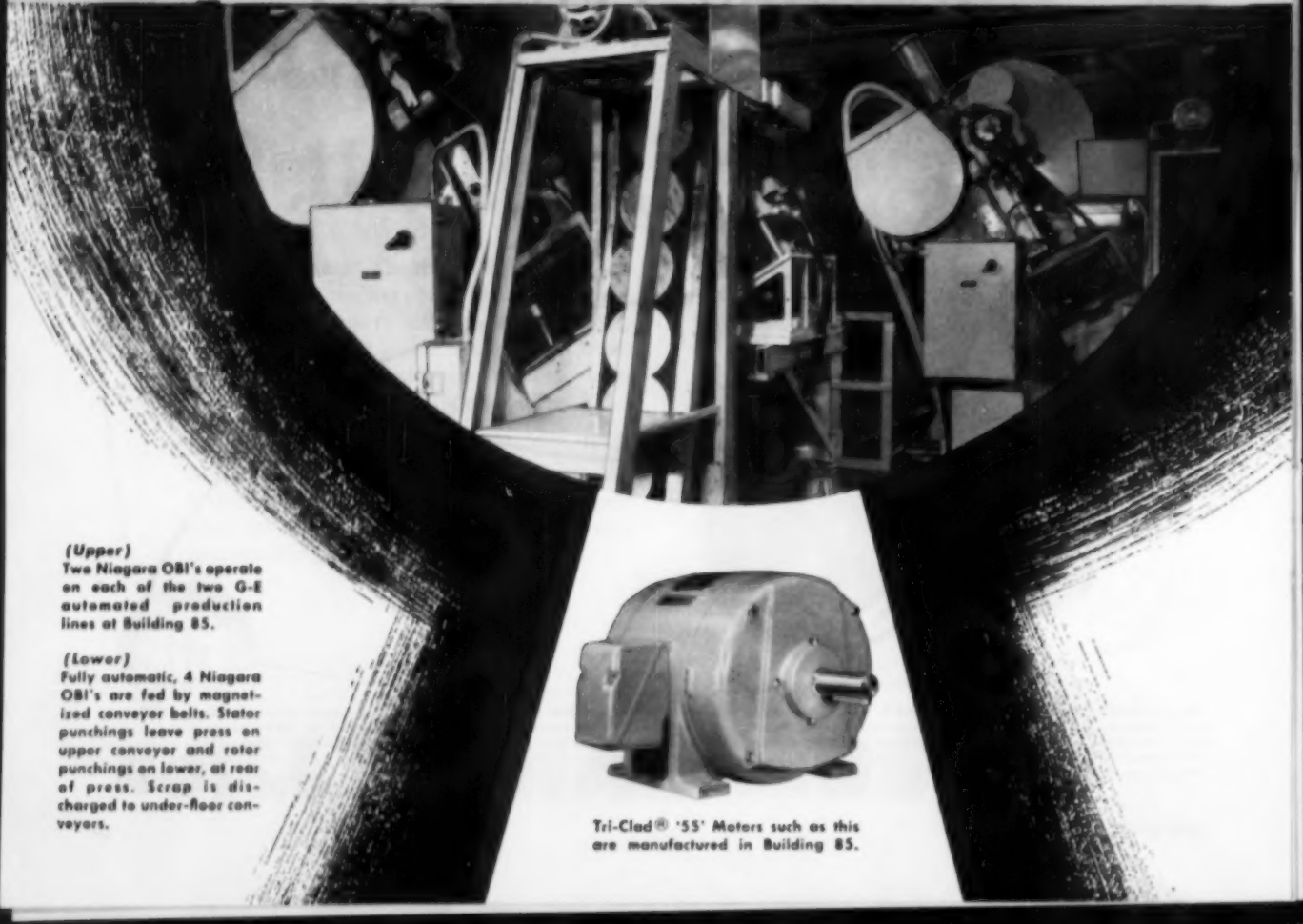
keyhole view of key operations in . . . . .



4 NIAGARA AUTOMATIC OBI's PUNCH OUT



(Upper)
Two Niagara OBI's operate on each of the two G-E automated production lines at Building 85.

(Lower)
Fully automatic, 4 Niagara OBI's are fed by magnetized conveyor belts. Stator punchings leave press on upper conveyor and rotor punchings on lower, at rear of press. Scrap is discharged to under-floor conveyors.

Tri-Clad® '55' Motors such as this are manufactured in Building 85.

GENERAL ELECTRIC'S "SUPER SECRET" BLDG. 85 WHICH CUT MOTOR PRODUCTION TIME FROM 2 WKS. TO 24 HRS.

Strictly "hush-hush" for its first year and a half of operation, General Electric's now widely publicized Building 85 in Schenectady gives the rest of the metalworking industry plenty of food for thought.

Chopping down production time of 7½ - 30 hp induction motors, from 2 weeks to 24 hours, is no mean feat. G.E.'s medium induction motor department has done it with the very latest ideas in mechanized fabrication.

Helping to perform the important job of punching out lamination blanks for stators and rotors are 4 fully automatic Niagara OBI Presses. Each is equipped with General Electric ACA adjustable speed drives for maintaining flexibility in the flow of parts to meet market demands for 100 standard motor models . . . the very feature that Building 85 is famous for: *Variety and Automation, too!*

Fitting perfectly into the scheme of things at this, the most modern of electric motor plants, Niagara OBI's operate on fully automatic cycles. Automatically fed by magnetized conveyor belts, they likewise discharge their work automatically to the next operation. Metal waste is removed by under-floor conveyors.

Tough assignment for an OBI? Not for a Niagara! On last report, G.E. was getting 100,000 punchings per press from each set of dies

ROTOR AND STATOR LAMINATION BLANKS

between re-grinds. Longer die life is one of the assured benefits from the rugged, rigid, all-welded steel Niagara frames.

Pacemaker of the press industry, Niagara has the most to offer in OBI's . . . whether it's the Single Crank Electro-Pneumatic Clutch type used in this G-E plant, the Double Crank type for long die area work or the revolutionary new Front-to-Back Crankshaft design in automated or standard models. Now that you have the G-E story, get the whole Niagara story, too. Request literature.

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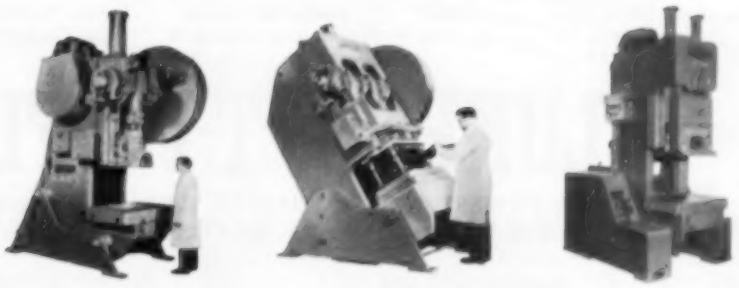
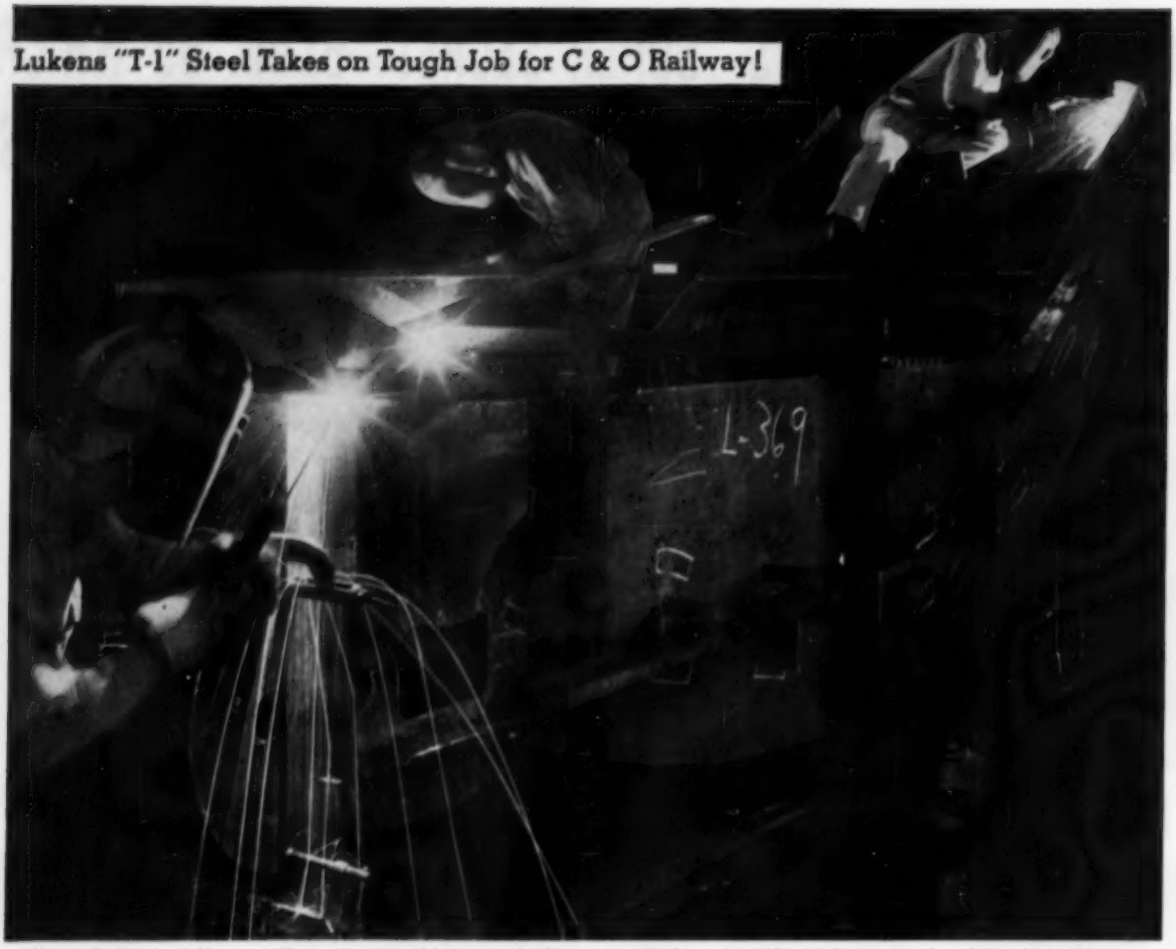
NIAGARA OBI PRESSES



Lukens "T-1" Steel Takes on Tough Job for C & O Railway!



Horne Brothers of Newport News, first-line fabricators to the shipping industry, are building several new, improved coal trimming machines for the C & O Railway. Lukens "T-1" steel was specified to cut weight, combine strength and abrasion resistance. A number of other Horne Brothers' projects of Lukens "T-1" steel are already in the works.

Fabricator of unique new coal loader says:

"NEVER WORKED WITH AS TOUGH AND STRONG A STEEL THAT'S SO EASY TO WELD!"

■ *Enthusiastic* is the word for Horne Brothers' reports on Lukens "T-1" steel. They call it the best steel yet to combine strength and toughness, impact and abrasion resistance, and the all-important feature of excellent weldability.

Lukens "T-1" steel is economical, too. On this coal loading machine, for example, Horne Brothers was able to effect a 25% reduction in overall plate thickness—a direct result of this new steel's great strength. The finished machine will weigh far less than previous trimmers, operate with greater efficiency, less maintenance and increased life expectancy.

No wonder Horne Brothers is so well satisfied. No wonder they are planning to build more equipment of Lukens "T-1" steel—*right away!*

If your problem is equipment weight . . . abrasion, impact or atmospheric corrosion . . . the need for toughness at temperature extremes . . . it will pay you to investigate this amazing new alloy steel now.

For the latest in fabrication techniques and specifications, write to Manager, Marketing Service, 4[illegible] Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania.

LUKENS "T-1" STEEL

LUKENS

THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS
LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

THE CLARK CONTROLLER COMPANY

INTEROFFICE CORRESPONDENCE

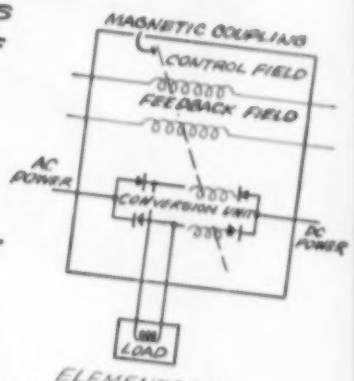
FROM: APPLIED ENGINEERING DEPT. TO: ADVERTISING DEPT.

SUBJECT: MAGNETIC AMPLIFIERS m/a

HERE ARE THE SIMPLE FACTS ABOUT OUR MAGNETIC AMPLIFIERS:

USED PRIMARILY AS INDUSTRIAL DRIVE REGULATORS ON CONTROL SYSTEMS, THEY CONSIST BASICALLY OF THREE MAGNETICALLY-COUPLED ELEMENTS:

1. A CONTROL FIELD –
2. A FEEDBACK FIELD –
3. A CONVERSION UNIT –



ELEMENTARY MAGNETIC AMPLIFIER

IF CONTROL FIELD AMPERE TURNS EXCEED FEEDBACK FIELD AMPERE TURNS IN A POSITIVE DIRECTION, OUTPUT IS TURNED ON. IF THE REVERSE OCCURS, OUTPUT IS TURNED OFF.

HERE'S HOW THIS IS APPLIED: IN A GENERATOR VOLTAGE REGULATOR, FOR EXAMPLE, THE CONTROL FIELD IS CONNECTED TO A REFERENCE SOURCE OF VOLTAGE, THE FEEDBACK FIELD TO THE ARMATURE TERMINALS, AND THE SHUNT FIELD TO THE LOAD TERMINALS. INCREASING AMPERE TURNS IN THE CONTROL FIELD TURNS ON THE REGULATOR, RAISING GENERATOR VOLTAGE UNTIL FEEDBACK BALANCES CONTROL FIELD, AT WHICH POINT THE SYSTEM STABILIZES.

AMONG THE MANY REGULATING SYSTEMS USING THIS PRINCIPLE ARE: CONSTANT TENSION COIL WINDING, SPEED REGULATION, POSITION REGULATION (LOOP CONTROL, EDGE CONTROL, SYNCHRONIZING CONVEYORS, ETC.).

MECHANICAL SCHEME FOR CONTINUOUS WEB OR STRIP PROCESSING CONTROL

THE MAGNETIC AMPLIFIER HAS ALMOST LIMITLESS APPLICATION AS A "SERVO" DEVICE TO MAINTAIN A PRE-DETERMINED RELATIONSHIP BETWEEN TWO FACTORS AS IN HEAT CONTROL, WEIGHT OR VOLUME CONTROL, PRESSURE CONTROL, TRANSDUCERS, METERING, CONTINUOUS PLATING CONTROL, ETC.

AS YOU CAN SEE FROM THE ABOVE, CLARK MAGNETIC AMPLIFIERS ARE IDEAL FOR USE IN AUTOMATION SYSTEMS. THEY ARE STATIC DEVICES WITHOUT TUBES, THUS REQUIRING NO WARM-UP TIME AND PRACTICALLY NO MAINTENANCE. THEY ARE FACTORY ADJUSTED, SIMPLIFYING INSTALLATION.

Clark's wide experience in applying magnetic amplifiers to industrial drives is at your service.

The CLARK CONTROLLER Company

Engineered Electrical Control

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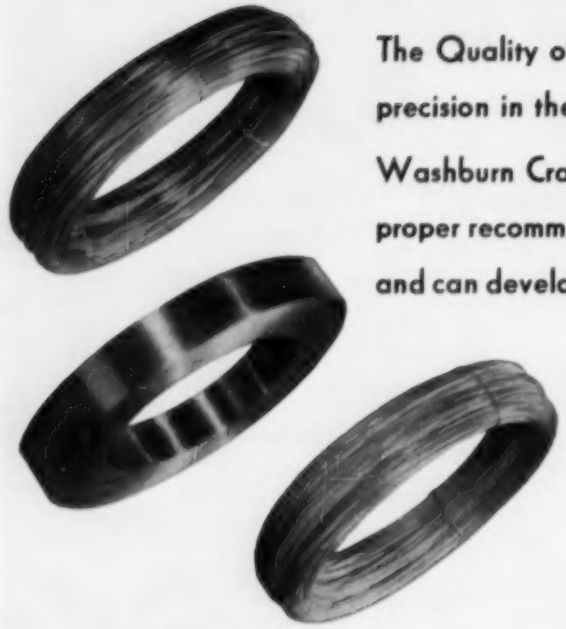
Precision assures Quality



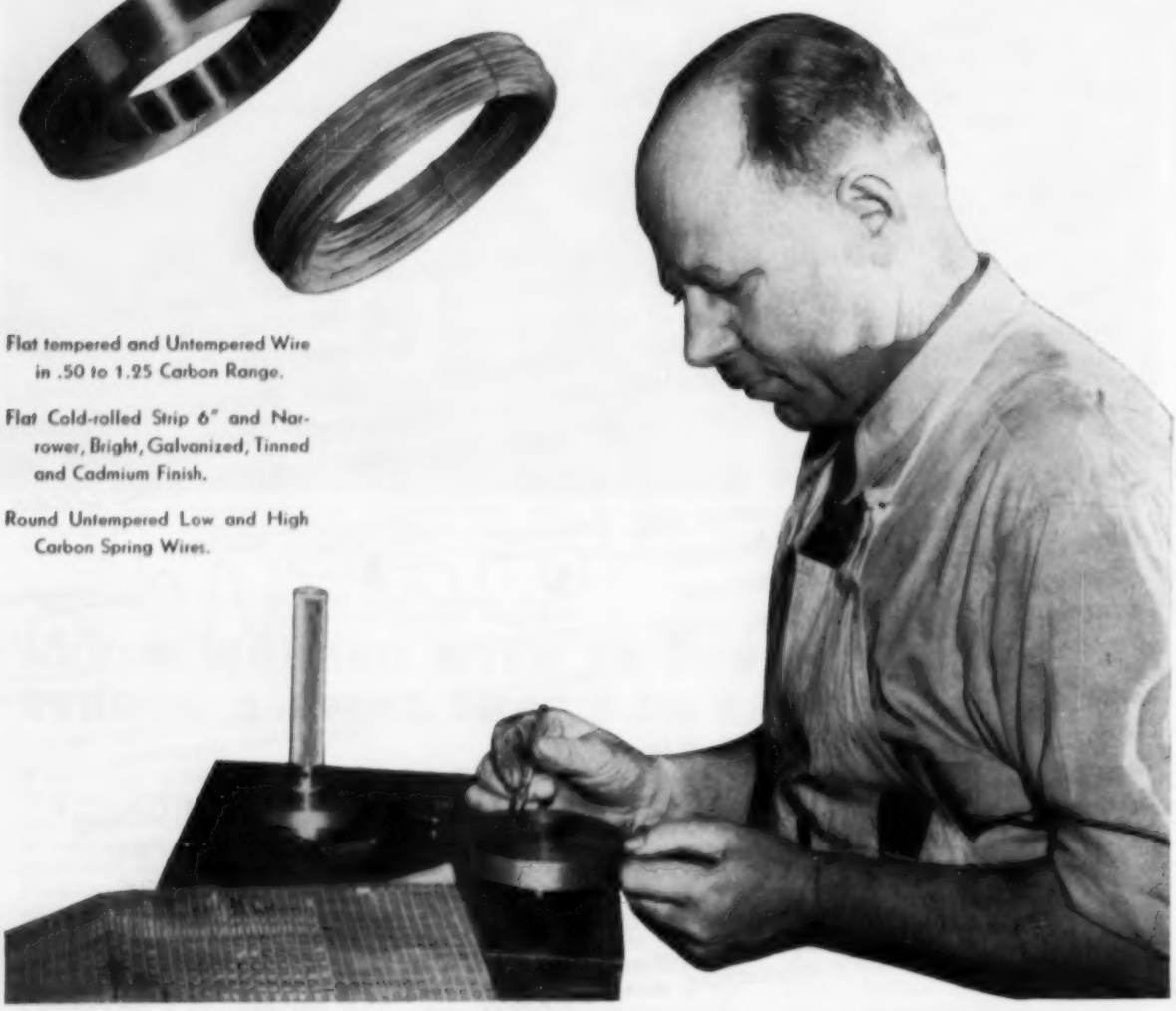
The Quality of Performance of *your* product depends on the precision in the manufacture of its component parts.

Washburn Craftsmen know, through years of experience, the proper recommendation for hundreds of widely varied products and can develop wire or strip to assure top quality performance.

Flat tempered and Untempered Wire in .50 to 1.25 Carbon Range.

Flat Cold-rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish.

Round Untempered Low and High Carbon Spring Wires.



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WASHBURN

CLEAN, UNIFORM BILLETS—STRIP—RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

Pangborn Rotoblast® speeds production at Beloit Iron Works!

Blast cleaning with a Pangborn Rotoblast Table-Room, Beloit Iron Works, Beloit, Wis., has upped production from 1.2 tons per hr. to 3.25 tons per hr.—an increase of 170%—while cutting labor costs!

And at Link-Belt, too!

Faster cleaning with Blastmaster Rotoblast Barrel at Olney Foundry Division, Link-Belt Company, Philadelphia, has stepped up production 20% to 25%!

Tables, rooms, barrels—whichever blast cleaning machine best fills your cleaning needs, Pangborn Rotoblast will speed *your* production.

Pangborn Rotoblast cuts operating time by cleaning *quickly*, throwing a heavy volume of abrasive over a large surface area. The result is higher production and, therefore, lower cleaning costs. Add the "plus" benefits of reduced labor costs and better cleaning quality and we think you'll agree Pangborn Rotoblast is worth investigating. Take a few seconds now to send for more information—it can save you thousands of dollars later.

Write for Bulletin 227 to PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

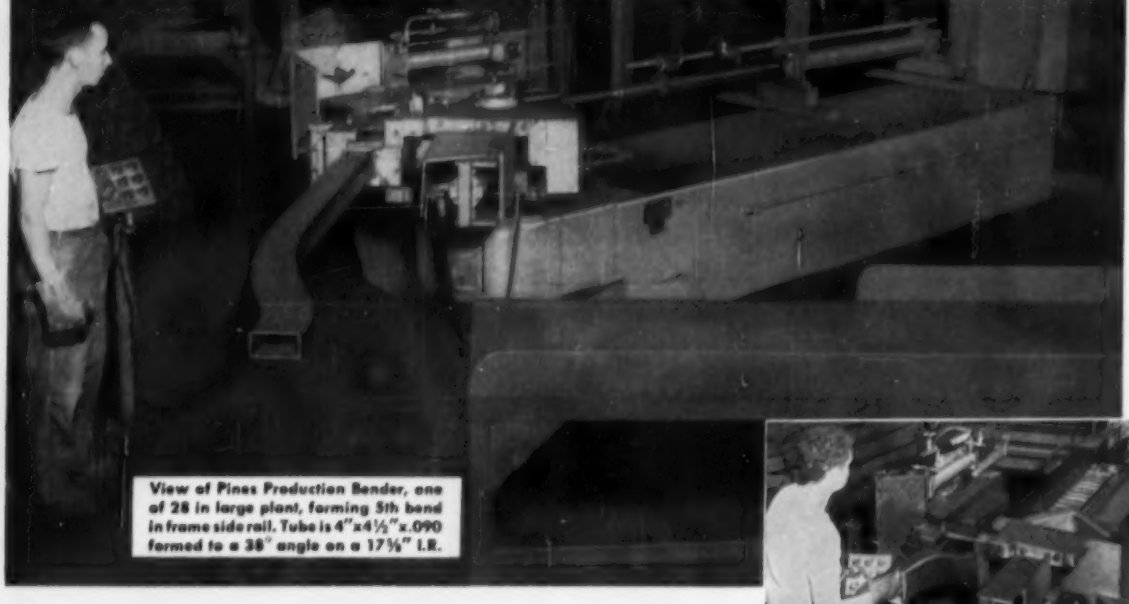
Pangborn

BLAST CLEANS CHEAPER

Rotoblast Blastmaster® & Continuous-Flo Barrel | Rotoblast Tables & Table-Rooms | Special Blast Rooms & Cabinets | Pangborn Dust Control Equipment

Distributors for Malleabrasive and Tru-Steel Abrasives

Now-COLD BENDING THE "PINES-WAY" PRODUCES MORE ACCURATE AUTOMOBILE FRAMES



View of Pines Production Bender, one of 28 in large plant, forming 5th bend in frame side rail. Tube is 4"x4½"x.090 formed to a 38° angle on a 17⅛" I.R.

▲ Close-up view of machine used to produce 4th bend in long side rail member. Five different bends are made in this piece, each in sequence on separate machines. Accuracy is held within .030" to .045" at seven check points. Spring-back is easily controlled by simple stop settings — an important factor that cuts tool costs.

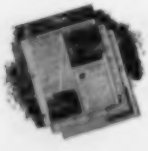
Production Bending Methods Simplify Fabricating Problems, Cut Assembly Costs

● The unusual versatility of PINES Bending Machine methods is again demonstrated by the successful production line application shown above in a large plant manufacturing automobile frames. Proven by more than eighteen months of operation, a battery of twenty-eight special PINES Benders are now forming tapered welded steel tube frame members at a rate of 120 bends per hour. These machines with their ingenious tooling — designed, developed, and built by PINES — form seven bends in each side rail member and produce more accurate parts than ever before possible. The end result is a stronger, more accurate chassis that greatly reduces body assembly problems.

Typifies Progress in Cold Bending Techniques

This revolutionary new manufacturing method is the result of long months of cooperative efforts between Pines and automotive engineers. It is typical of the consistant progress being made in profitable application of cold bending in the manufacture of a wide variety of metal products. It may also pay you to investigate the design possibilities and the production advantages of cold bending the "Pines-way." At your first opportunity call in our Sales Engineers for free survey.

▲ View of a flexible articulate mandrel used for making a bend at a right angle to, and within, a previously bent section. Mandrel is automatically inserted and expanded. Insures smooth, neat bends.



Write FOR MORE DATA

If you would like case study data on production bending, write today for free copies of Pines News.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery

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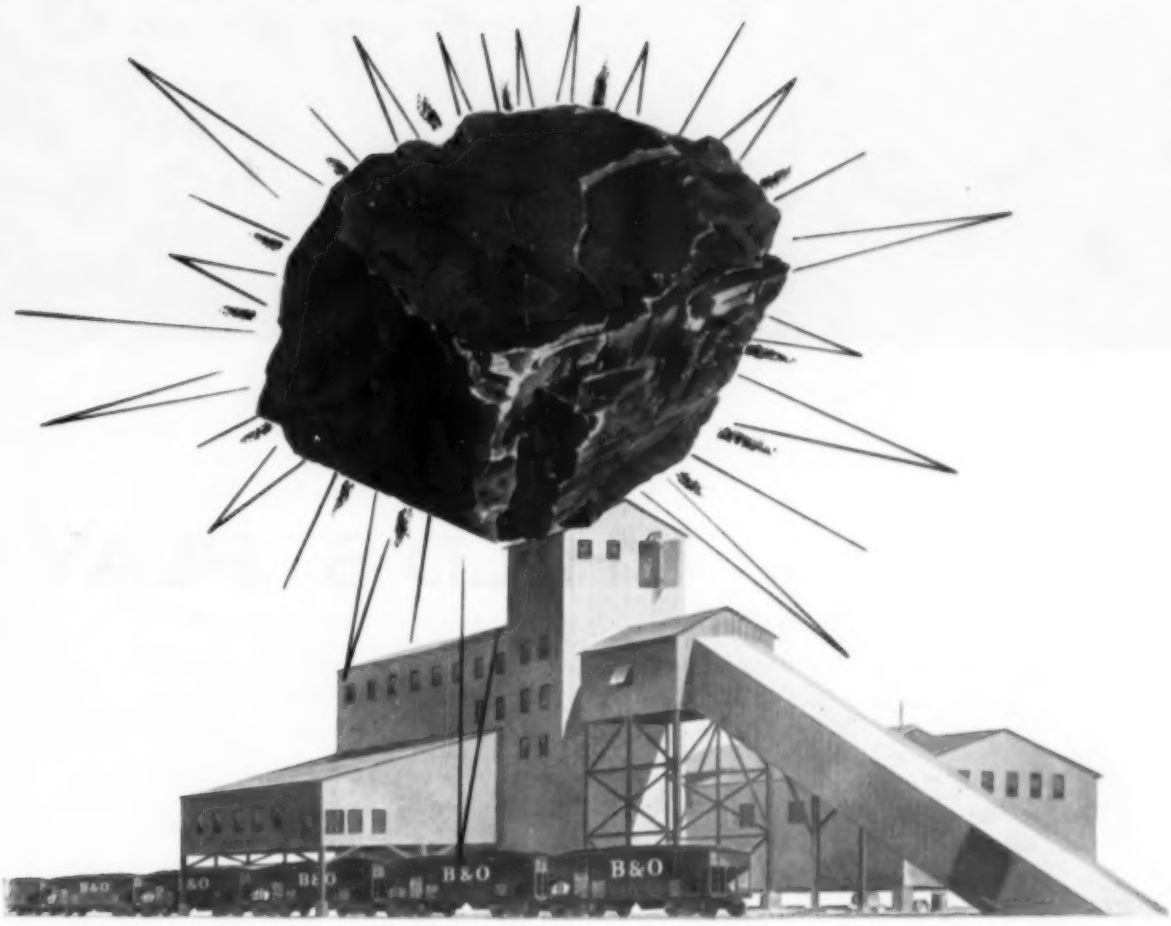
PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY



Energy Unlimited!

BILLIONS OF TONS OF LATENT POWER... READY TO MEET THE FUTURE'S NEEDS

➔ Bituminous coal offers the nation a priceless commodity —a virtually untapped source of low-cost power. The B&O serves areas with proved *usable* reserves containing billions of tons of this *fuel with a future*, convenient to industry's heaviest concentration.

As population grows and living standards soar, the added energy requirements can easily be met by B&O Bituminous. In addition, its modern mining and utilization will assure greatest efficiency at stable, low cost. *Ask our man!*

LET OUR COAL TRAFFIC REPRESENTATIVE HELP YOU!
He will gladly suggest the perfect constant-low-cost Bituminous coal for your particular needs.
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BALTIMORE & OHIO RAILROAD

CHILD'S PLAY

Speed is not enough! To pay for itself out of reduced operating costs and increased profits, today's machine tool must be:

1. Easy to understand. 2. Child's play to operate.

3. Quick to convert in change-over and re-tooling.

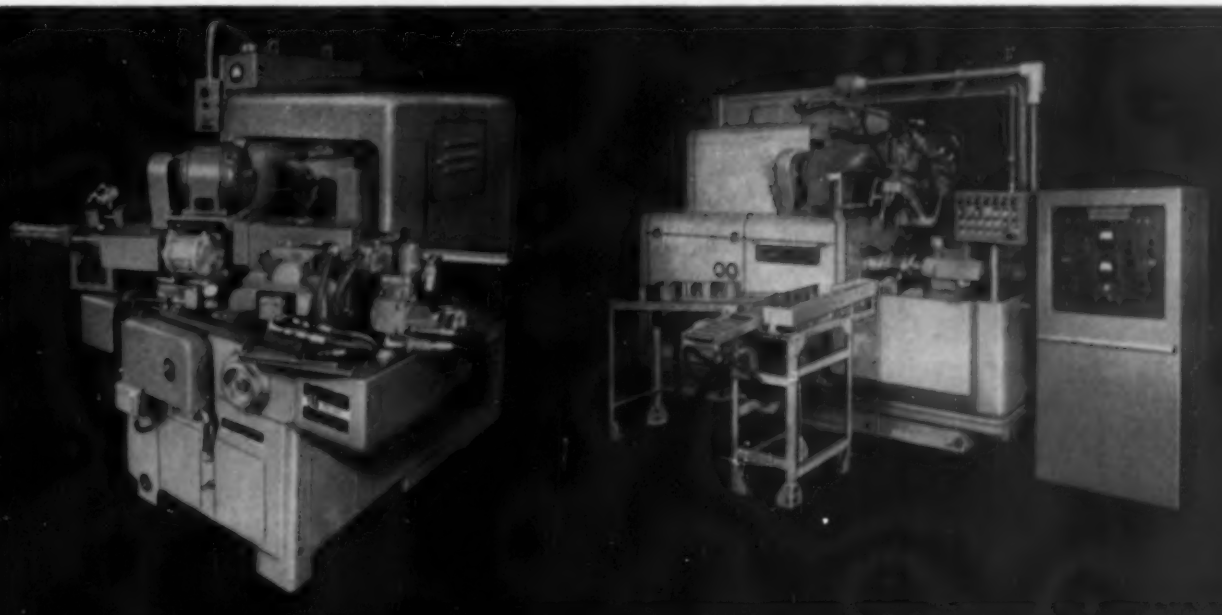
4. Push-button simple to demonstrate in operator training.

Here are a few of the many advanced engineering features which have made today's Jones & Lamson machine tools the most flexible and cost-efficient metal cutting equipment in the industrial world today.

Two-way tracing combined with normal turret lathe operation; Hydra-clutch headstock and Geneva saddle for simple "on the machine" handling; Automatic handling, gaging, chip disposal, sorting, tool adjustment on single spindle automatics; Tape controlled turret lathes for flexibility on long or short run jobs with pre-set tooling, no hand controls; Thread and form grinders with fully automatic handling and machining cycles; Contour grinders controlled hydraulically or optically, and "Automatic thread chasing on standard turret lathes".

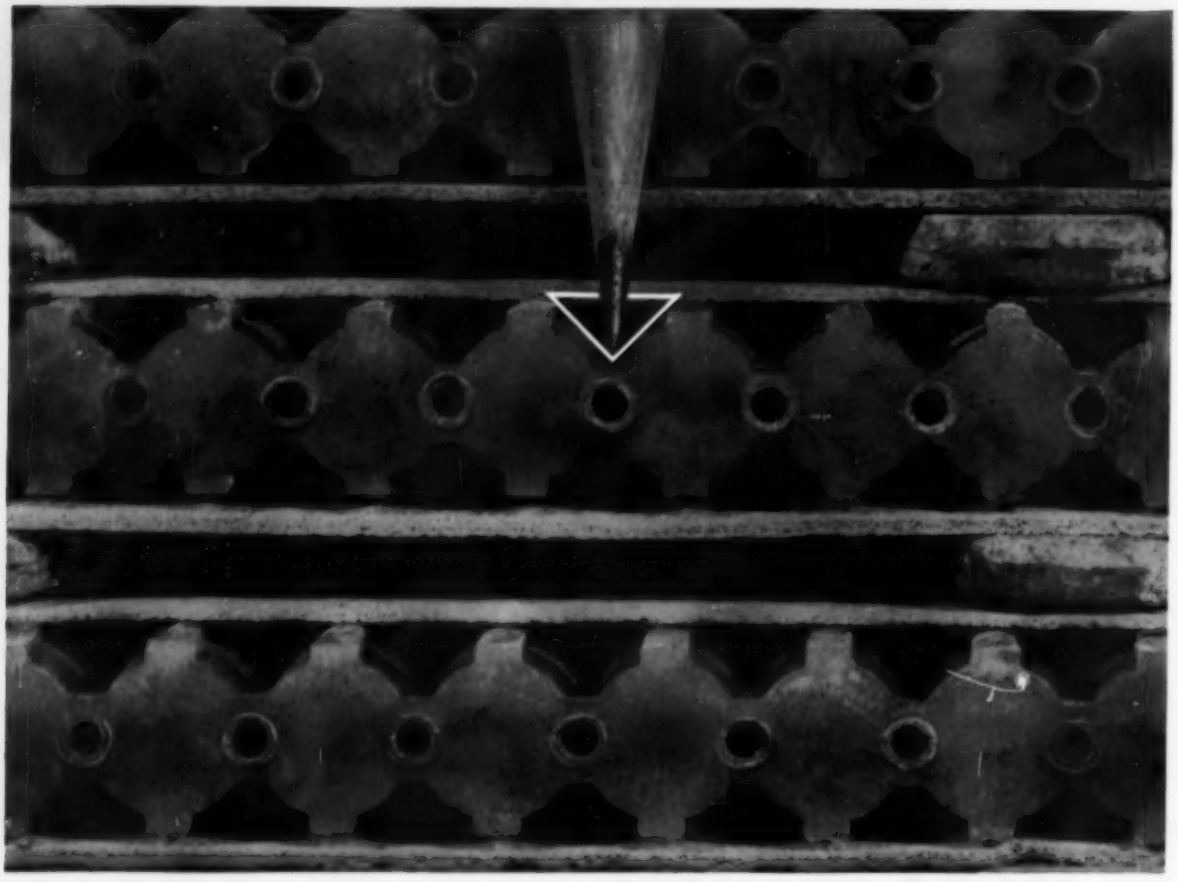
JONES & LAMSON MACHINE CO • 517 CLINTON ST • SPRINGFIELD, VT.

Turret Lathes *Fay Automatic Lathes* *Milling & Centering Machines* *Thread & Form Grinders* *Optical Comparators* *Threading Dies & Chasers*



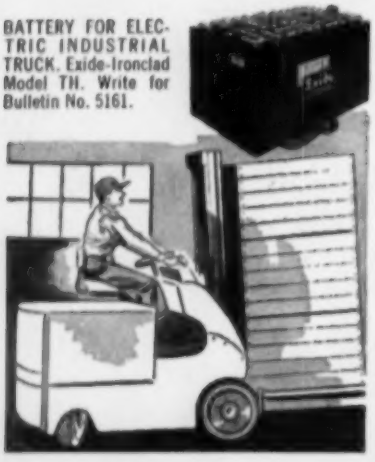
EXIDE-IRONCLAD BATTERIES

For electric industrial truck operation



BOTTOM VIEW shows tubular construction of positive plates in an Exide-Ironclad Battery.

Pools of electrolyte next to plates speed heavy load response



BATTERY FOR ELECTRIC INDUSTRIAL TRUCK. Exide-Ironclad Model TH. Write for Bulletin No. 5161.

When the man at the control says "More power—fast," the positive plate in the storage battery says "More electrolyte—instantly." That's why the Exide-Ironclad Battery can meet heavy load demands so much more rapidly than other types of batteries. And it's the reason they outperform others in so many uses.

Adjacent to every positive plate in the Exide-Ironclad Battery are these triangular pools of electrolyte standing in reserve. When the call comes for power, the electrolyte is right there where it's needed for swift, sure response. There's nothing to slow down the action. Tiny slits in plastic power tubes let electrolyte in—yet prevent loss of active material. Only the Exide-Ironclad Battery has this construction.

This exclusive feature is only one of the many reasons Exide-Ironclad Batteries have proved so superior in countless applications. When you order batteries for heavy duty service, or the equipment that requires such batteries, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

Announcement!

...Cleveland

now offers a complete line of

Top Quality

Socket Screws

Our line of socket screws has been expanded to include all standard socket items, in all catalog sizes, made to Cleveland's extra high standards of quality.

- Socket Head Cap Screws
- Socket Set Screws
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Complete stocks of Cleveland Socket Screw Products are available for immediate shipment. Write for new Socket Line Folder.

Among the facilities already in use at the modern new Cleveland plant is this spacious metallurgical and chemical laboratory.

The Cleveland Cap Screw Company

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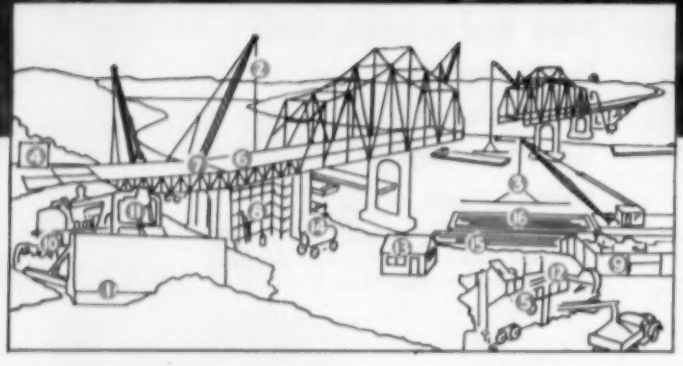

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4. Clinton Welded Wire Fabric
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6. Cal-Tie Wire
7. CF&I Concrete Reinforcing Bars
8. CF&I Nails & Spikes
9. Realock Fence
10. Wickwire Springs
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12. Claymont Fabricated Steel Parts
13. Gold Strand Insect Wire Screening
14. Claymont Flanged & Dished Heads
15. Claymont Carbon & Alloy Steel Plates
16. Claymont Large Diameter Steel Pipe

PRODUCTS *help on tough jobs!*

Today's builders are specialists who know how to get a difficult job done... and done economically.

No wonder you'll find these CF&I Products on so many construction jobs—for they help do the job swiftly, economically and safely.

You, too, can use these CF&I Products to advantage on your bridge, road or other construction job. For full details, see your nearby CF&I representative.

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...To Spring Satisfaction passes near you...

A unique springmaking service . . .

making available to bustling industrial areas a vast pool of integrated skill and research—through separate, complete operating Divisions.

Factory-trained sales and engineering field men.

Design literature available on all types of springs.

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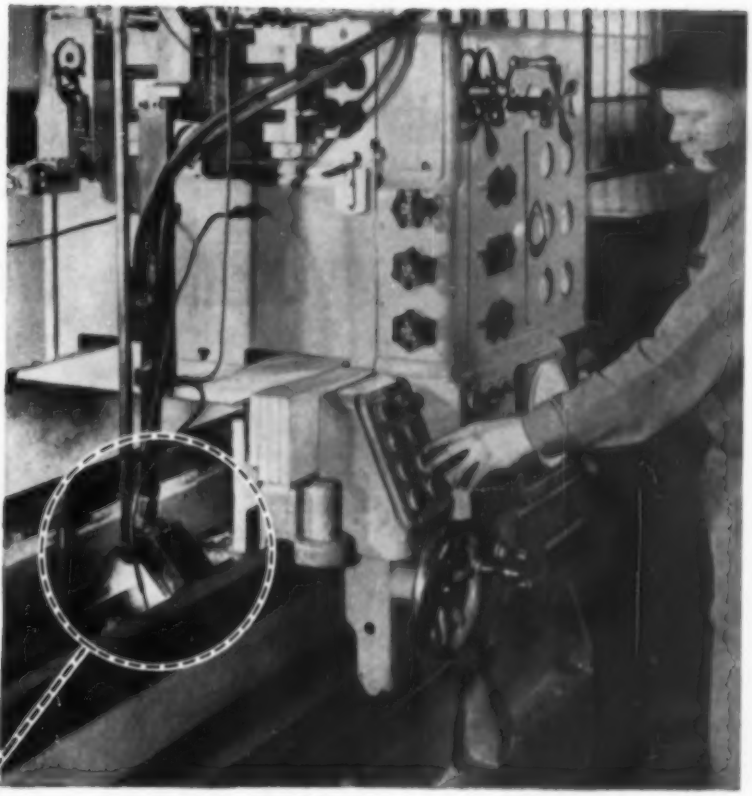
HIGH SPEED FLAME-HARDENING



Cross-section view shows uniform depth of hardened surface.

SPECIAL MACHINE UPS LIFE OF GRAPHITIC STEEL PARTS

LINDE engineers have assisted Cincinnati Steel Treating Company in developing a flame hardening machine which increases service life of 16 ft. long, graphitic carbon steel lathe ways . . . Development of this automatic, high speed machine is another example of how LINDE Service Engineers are helping LINDE's customers up production speed and unit quality through co-operative research engineering.

With this new machine, a lathe way to be treated is placed on a magnetic chuck in a water filled channel. Flame-hardening heads and control mechanism move at predetermined speeds along the part. After it cools, the lathe way is placed in a refrigerator for 24 hours which stabilizes the steel, and brings its case hardness to a minimum of 60 Rockwell "C" scale.

The benefits of LINDE's research, engineering, and over 40 years of accumulated know-how stand behind each of its customers to help them solve production problems. Get these "plus-values" which LINDE offers—it pays you to do business with LINDE.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
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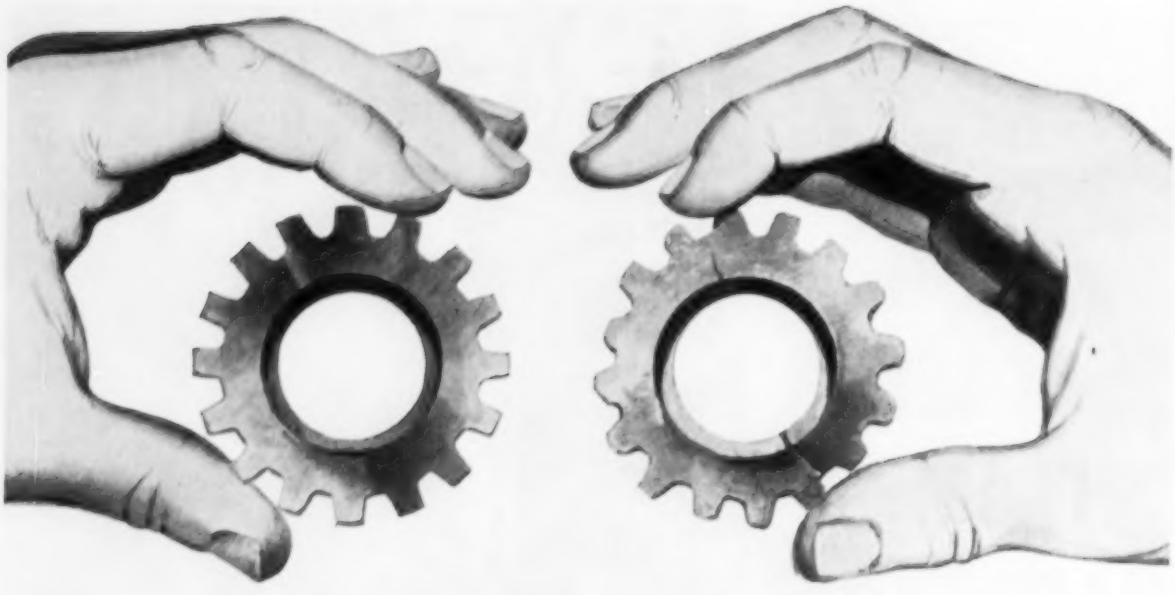


"What's wrong? They're both 8620 alloy steel!"

A Baltimore manufacturer was working on an order for oil pump gears of 8620 alloy steel. The first lot of steel attained satisfactory core hardness—but the second lot would not meet minimum hardness requirements.

Both lots were bought from a reputable source. What went wrong?

The same alloy, sure—but different heats!

The manufacturer ran into trouble because the chemical composition and hardenability of different furnace heats of the same alloy can and do vary (within AISI and SAE limits) enough to have a marked effect on heat treatment response. As a result of such variation, the "right" alloy failed.

Here's why this can't happen with Ryerson alloys

Unfailing protection against the hazards of varying properties and hardenability is always yours when you specify and buy Ryerson certified alloys. That's because we test *your particular lot of steel* for heat treatment response, verify its chemical composition—and give you a record of these tests, keyed to the identification symbol on the steel.

So there's no guesswork—no need to rely on *typical* hardenability figures for your type of steel. With Ryerson certified alloys you know the *actual*, proved hardenability of the steel.

This extra assurance of quality doesn't cost you a cent—and it's only part of an 8-step quality control program to prevent the breakdown of equipment, the scrapping or reworking of rejects that may result when you're not sure of the alloys you buy. So next time—order Ryerson certified alloys and be sure.

RYERSON STEEL

In stock: Bars, structurals, plates, sheets, tubing, alloy and stainless steel, reinforcing bars, machinery & tools, etc.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Metalworking Outlook

Trouble Again in 1958?

How good is steel's three-year contract? Some labor observers believe the industry may hit trouble in 1958, if Walter Reuther's Autoworkers win a better package than the Steelworkers will get in their second yearly raise. Pressure then would be on the companies to come through with a parallel increase. Meanwhile, it looks like the steel settlement is already setting patterns. Metal fabricating companies in the Cleveland area have been served notice that the unions will expect settlements from them "equal to the steel package on wages, though all fringes will not be applied."

Coming: Another Rail Freight Hike

Watch for another nationwide increase in freight rates later this year. It hasn't been six months since the Interstate Commerce Commission allowed a 6 per cent boost in rates. The eastern roads, whose operating margins are lower than those of western and southern regions, are being pinched again by increased labor and material costs. Timing on the increase is uncertain. Likely: Action will be postponed until all railroads have completed their 1956 wage negotiations.

PA's See Better Business

New weight to the conviction that business levels will run above those of the first half the remainder of the third and the fourth quarter is given by the July report of the Purchasing Agents Association of Chicago. Members noted an abrupt pickup in order backlogs from June to July. Over 80 per cent of the PA's expect business to be as good or better in the second half. An encouraging 67 per cent whose first half was "not good" expect the last half to be better.

Housing Starts To Slide

A minimum drop of 250,000 housing starts during 1956 at a cost of more than $3 billion to the economy is foreseen by John M. Dickerman, executive director of the National Association of Home Builders, Washington. Mr. Dickerman blames the government's credit restrictions and "tight" mortgage money. There's little hope for any relaxation. Washington is too concerned over the possibility of inflation following the steel settlement to back down now.

Washington To Woo Small Business

Watch for tax relief for small business to be a major legislative issue next year. Several cabinet-level officers are strong advocates of action. Big business will probably be assessed to make up any revenue loss. At-

Technical Outlook—p. 99 Market Outlook—p. 137

tempts to get action in the last Congress didn't come off, because the administration provided little support.

Steel Distribution Under Fire

Conclusions of the Senate small business committee report on steel distribution patterns (see page 56) probably won't be out until January. A hint of what's coming can be found in the text of an earlier Senate report: "The steel industry should give grave consideration to the growing sentiment inside and outside government toward socialization of major industries. The steel industry has been repeatedly warned that it must put its house in order or face regimentation." Reason for the current sharpshooting: Some independent fabricators complain that they're not getting a fair shake from mills.

Styling Changes To Affect Auto Suppliers

Look for styling changes to alter demand patterns in the auto industry in the next few years. Sculptured steel (see page 63) may do away with much of the trim now used for relief and contrast. Pressure will be on diemakers to develop more versatile sheet metal tooling for new stamping. New material handling techniques also will be needed by auto plants.

Help Wanted: Skilled Foundrymen

More skilled workers and greater use of technology will be needed by foundrymen, says W. F. Patterson, director, Bureau of Apprenticeship, U. S. Department of Labor. By 1960, production of castings will increase 40 per cent, while employment will go up only 20 per cent. The number of all-around molders needed by the industry will increase 10 per cent; machine molders, 20 per cent; technicians, 25 per cent.

Titanium Costs To Drop

A commercial method of producing titanium by an electrolytic process has been developed by Horizons Inc., Cleveland. The Navy Bureau of Aeronautics awarded Horizons a $200,000 development contract on the process, which will produce titanium at less cost than the Kroll method.

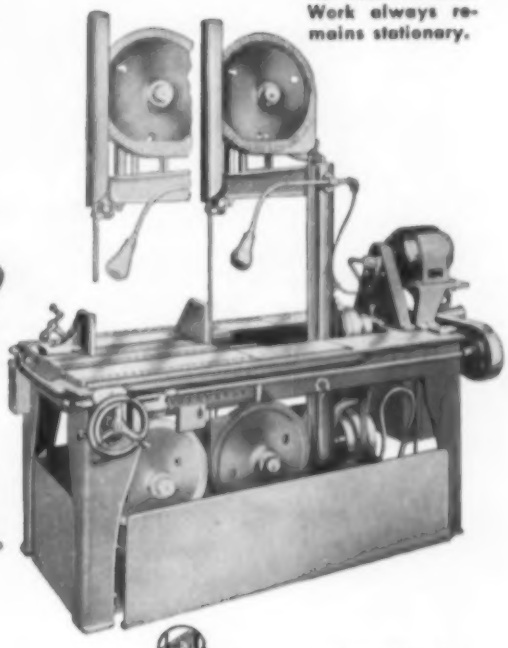
Straws in the Wind

Between March and June, Yugoslavia exported 83,000 tons of steel beams. Most went to the USSR, but England, Switzerland, Greece and Uruguay were other buyers . . . Armco Steel Corp., Middletown, O., has entered a 50-50 partnership with a German steel company to make galvanized steel equipment for railroads . . . Studebaker-Packard Corp. may market Daimler-Benz cars in the U. S. . . . Los Angeles has grown to the world's second biggest lift truck market, behind Detroit, says Yale & Towne Mfg. Co. The industrial truck maker will begin a large-scale expansion of western operations . . . Small civilian plane makers increased their exports 25 per cent over those of last year's first half . . . General Electric Co. will spend $2 million to expand atomic pump production.

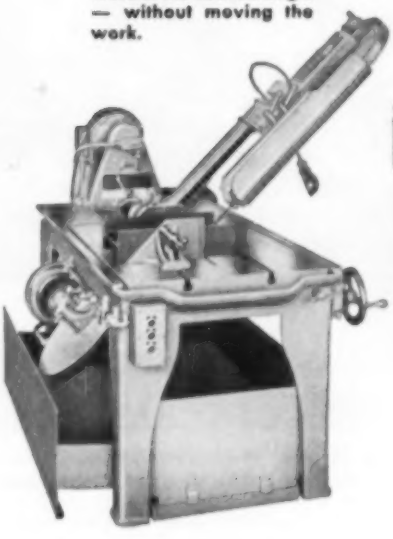
Never Confuse the No. 8 MARVEL with an ordinary Band Saw

...only the MARVEL is Universal

Only on a MARVEL No. 8 does the blade remain at a right angle throughout its full 18" feed traverse. Work always remains stationary.



Only on a No. 8 MARVEL can the saw column be instantly indexed and locked at any angle from 45° right to 45° left, and the saw then fed thru the work at the desired angle — without moving the work.



Only a No. 8 MARVEL can do all of these things: Snip-off a ⅛" rod or cut-off an 18" x 18" cross section

Rough to Size and Shape

Miter

Index

cut off and shape Structural Beams.

Only a No. 8 MARVEL has the large T-slotted work table, with removable quick action vise, that permits accurate set-ups of work of unrestricted sizes and shapes, special fixtures; Etc.

"Rough Machine" to size and shape with minimun chip waste

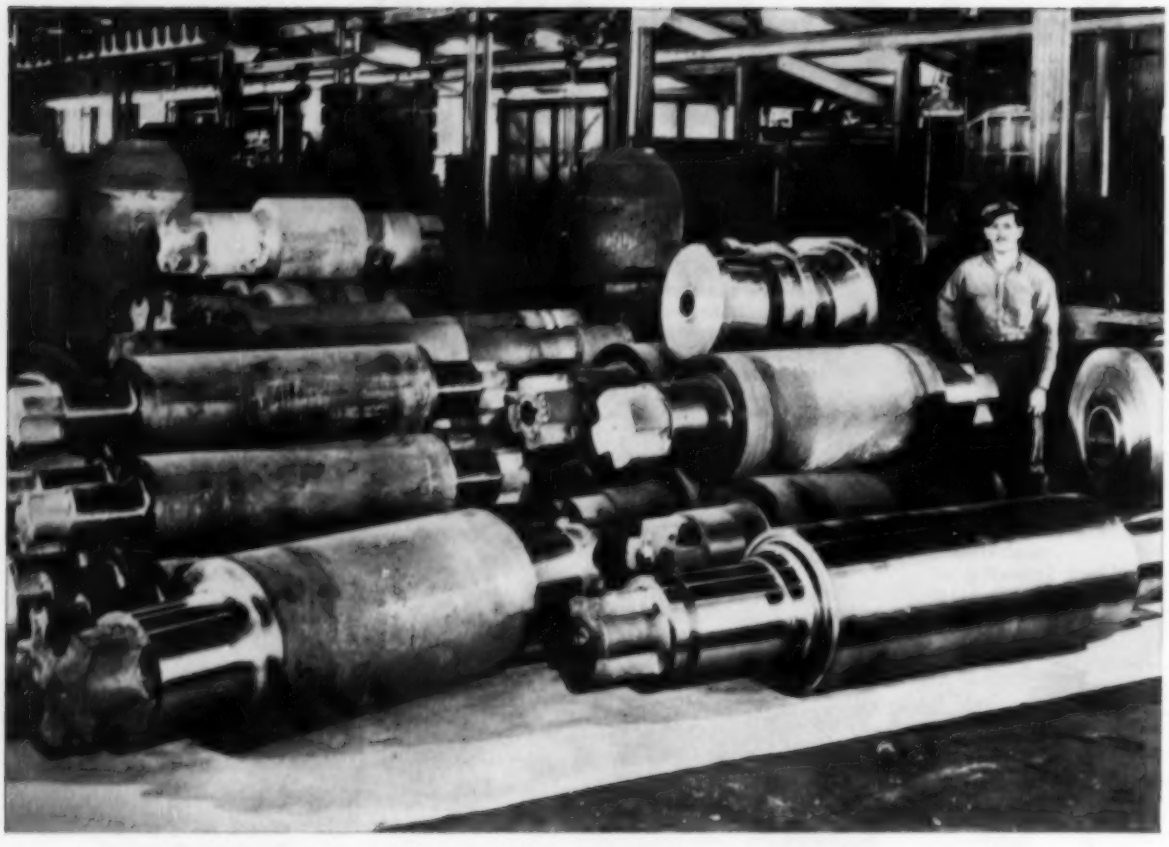
The No. 8 MARVEL is the "busiest tool in the shop" wherever installed because it is a *universal* tool—has both the capacity and the versatility to handle not only standard sawing jobs but innumerable "trick" and convenience jobs as well. More than a metal saw, the No. 8 MARVEL is a fine machine tool with machine tool features like: Both power and hand feeds; Depth Stops; Automatic Blade Tension; Built-in Coolant Pump; Three operating speeds (or six with 2-speed motor). Moisture-proof electrical controls that conform to both "J.I.C." and "MACHINE TOOL" electrical standards; Dirt-proof ball bearings, etc.

If you cut, machine or fabricate metal, this is a sawing machine you should know about. Write for catalog.

MARVEL *Metal Cutting* SAWS

Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. • 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.



Now . . . Many Types and Sizes of Rolls in ductile cast iron. Strong, tough and rigid, this useful engineering material makes metal-working rolls resist wear and give outstanding performance. Rolls shown were made by Aetna-Standard Engineering Co., Pittsburgh, Pa., a leading producer of ductile cast iron under the trade-name "Magaloy".

Ductile iron rolls give superior results ...reduce breakage, redressing, rolling costs

Many rolling mill operators say that reduced breakage is the chief advantage of ductile iron rolls.

Long service, without redressing, is an equally important benefit, however. In addition, these rolls resist fire cracking. They also produce a fine finish on the metal being worked.

As a result, users get more tonnage of quality rolled output . . . at low cost per ton rolled.

Today, ductile iron rolls are saving money for numerous mills rolling skelp, plate, shapes, structurals, bars, rods and billets. Because specifically desired properties . . . offered separately by conventional roll materials . . . are combined in ductile iron.

And note this particular advantage! Ductile iron rolls possess superior machinability as well.

Try ductile iron rolls. In your own mills. See first-hand how well they perform. Send for a copy of "DUCTILE IRON, The Cast Iron THAT CAN BE BENT!" It gives full details about this economical material, so write for it now.

Ductile Cast Iron gives you the properties that improve metal-working rolls

1. **Wear Resistance**
2. **Heat Resistance**
3. **Toughness**
4. **Rigidity**
5. **High Yield Strength**
6. **Superior machinability**

Despite its high wear resistance, ductile iron is easy to machine. In many fields, it's replacing more costly materials for improvement of products as well as process equipment.

DUCTILE D IRON **ductile iron . . . the cast iron that can be twisted and bent**

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street, New York 5, N. Y.

Moderation in Steel

In appraising its new labor contracts, the steel industry has applied the principle of moderation in passing along only part of resulting higher costs. But it leaves many unsolved problems.

On carbon steel products like plates and hot-rolled sheets, the increase is only $7 a ton; for carbon and alloy steels, the average is $8.50. A rise of $10 to $12 a ton had been expected.

Many factors other than wages were considered in setting up new price schedules. Playing a part were prices already established by competitive producers who operated during the strike, prices of other competitive materials and the dangers of another inflationary spiral.

You can only speculate on what higher wages and prices will mean. If higher steelmaking costs had been effective in 1955, average earnings of the steel industry would have been reduced $4 to $5 a ton. Some companies would have operated in the red.

For each cent added in wages, the industry figures that production costs rise about 60 cents a ton. So the 20.7 cent increase in the first year translates into $12.42 a ton in higher production costs. Thirty-two companies had net income averaging $9.51 per ton of steel produced in 1955. Eight earned less than $6 a ton; four earned $4 or less.

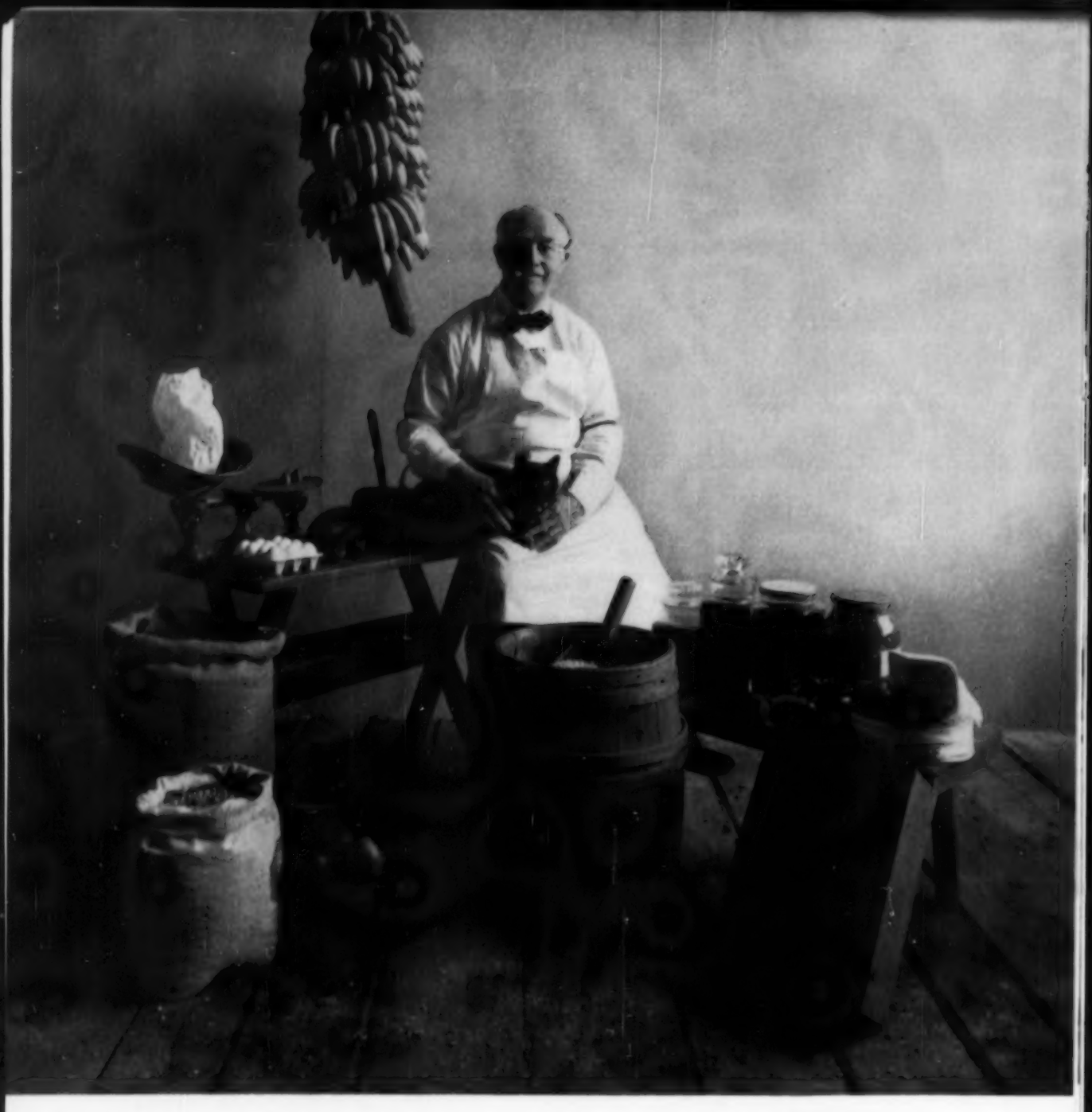
The $8.50 average increase ostensibly covers only part of higher costs ensuing from the new contract. Increased productivity can't make up the deficit. One large integrated producer reports that increased costs per ton since July, 1955, already had outstripped the price advances that went into effect at that time.

Production costs are scheduled to go up even more. In 1957 and again in 1958, steel wages will be increased 16 cents an hour without including possible cost-of-living adjustments, pension and insurance benefits not now calculable.

On top of the wage-price squeeze, the steel industry faces two problems: Gradual replacement of capacity capitalized at only $77.40 an ingot ton, with new facilities costing $300 to $325 a ton; and the financing of 15 million tons of new capacity in the next three years, 60 million tons in 15 years.

The new price structure will require continuing close study of cost-price relationships, more efficient production methods and efforts to obtain realistic depreciation allowances.

Irwin H. Such
EDITOR-IN-CHIEF



WHO TOOK THE CAT OUT OF THE GROCERY BUSINESS?

You don't have to be as old as the hills to remember when practically everything you lugged home from the grocery store came out of a sack, a crate or a barrel. The revolution in food packaging has taken place within recent years. Can-makers and food processors have placed on our tables an infinite variety of basic foodstuffs and exotic delicacies. Steel has shared in this progress. At Inland, we've been working closely with can and container manufacturers for many years, helping to make steel an increasingly versatile and useful packaging material.

INLAND STEEL COMPANY *38 South Dearborn Street, Chicago 3, Illinois*
Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York. Steel products supplied to the steel container industry include tin plate, black plate, hot and cold rolled sheets and strip. Other products: plates, structurals, Ti-Co galvanized sheets, 4-Way safety plate, bars, reinforcing bars, rails and track accessories, coal chemicals.

Base Price Increases on Selected Steel Products

Hot-rolled bars	up $8.50 per ton
Cold-finished bars	up $12.00 per ton
Standard structural shapes	up $8.00 per ton
Plates	up $7.00 per ton
Hot-rolled strip	up $7.00 per ton
Hot-rolled sheets	up $7.00 per ton
Cold-rolled sheets	up $8.50 per ton

(For complete list of new base prices, see page 50.)

3-Year Price Pattern Set?

The increase of $8.50 a ton falls short of what was expected. To help offset increased costs, extras may be raised as they were last year. Talk of fast tax write-offs grows

INCREASED STEEL prices will cost metalworking companies $275 million to $300 million this year, figuring that about 35 million tons of finished steel products will be shipped between Aug. 7 and Dec. 31.

U. S. Steel Corp.'s new base prices (see page 50), average out to an increase of $8.50 a ton. Individual product increases range from $7 to $21 a ton.

The price boost is less than expected: Anticipating U. S. Steel's move, smaller firms operating during the strike raised prices an average of $9 a ton. They are now getting in line with Big Steel.

What's Next? — There's plenty of speculation about further price raises, probably in the form of extras. They might add another $2 to $3 to the cost, if they follow the pattern set last year.

Even before the strike steel producers were complaining about their lack of expansion capital. With labor costs up 7.6 per cent in the first year of the new contract with the United Steelworkers of America, it seems unlikely that $8.50 a ton will pay for that and increases in the costs of purchased goods and services.

Pressure—Don't forget, it's an election year. The administration may have applied pressure to Big Steel to hold the line on prices for awhile, promising immediate help in the way of fast tax write-offs on steel expansion projects.

Noted Clifford F. Hood, U. S. Steel's president: "The new prices do not provide a solution to the problem that U. S. Steel faces with respect to inadequate depreciation allowances for the replacement of obsolete and outworn facilities; nor do they attempt to provide a solution to the many problems attending our expansion program."

Comparisons — Although the price increase is smaller than expected, it's more than last year's boost. This year's increased labor costs total 20.7 cents an hour, say steel industry sources. Last year's were about 15 cents.

Last year, prices went up $7.35 a ton immediately after the labor settlement, about 5.8 per cent. This year's percentage raise is 6.25 per cent.

Statisticians in industry estimate that the cost of steel in a $2500 auto is increased $14 by the price boost; in a $300 refrigerator, 95 cents; in a $2400 farm tractor, $6.50.

Outlook — The three-year contract gives the steel industry long desired stability. It also enables purchasing agents in metalworking to chart their buying patterns.

Increases in 1957 and 1958 in steel's base price will be lower than this year's because the labor package will cost less (about 16 cents an hour). Best guesses for price boosts in the next two years: Between $6 and $6.50.

U. S. Steel's New Prices

Effective date was Aug. 7. Other major steel producers are bringing their prices into line. Average increase is $8.50 per ton. Boosts range from $7 to $21

(All figures cents per pound unless otherwise noted)

	New Price	Increase
Carbon Steel		
Blooms, billets, slabs —forging quality	$91.50*	$7.00*
Blooms, billets, slabs —rerolling quality	$74.00*	$5.50*
Tube rounds	$111.50*	$8.00*
Skelp	4.625	0.40
Standard bars & small shapes— merchant quality	5.075	0.425
(Fairless Wks.	5.225	0.425)
Standard bars & small shapes— special quality	5.425	0.425
(Fairless Wks.	5.575	0.425)
Cold-finished bars	6.85	0.60
Concrete reinforcing bars	5.075	0.425
(Fairless Wks.	5.225	0.425)
Standard structural shapes	5.00	0.40
CBs (including CBL, CHJ & CB sections)	5.00	0.40
Bearing piles (CBP sections)	5.00	0.40
Sheet piling	5.90	0.45
Plates	4.85	0.35
Floor plates	5.925	0.35
Standard tee rails— No. 1 O. H.	5.075	0.35
Light rails	6.00	0.35
Tie plates	6.025	0.40
Joint bars for standard rails	6.35	0.525
Track spikes	8.775	0.725
Axles	8.10	0.60
Hot-rolled strip	4.675	0.35
Hot-rolled sheets (18 ga. & heavier)	4.675	0.35
(Fairless Wks.	4.725	0.35)
Cold-rolled sheets	5.75	0.425
(Fairless Wks.	5.80	0.425)
Vitrenamel sheets	6.325	0.425
Galvanized sheets, flat or formed	6.30	0.45
Long terne sheets	6.70	0.45
Electrical sheets (electrical grade hot-rolled—cut lengths 22 ga.)	11.00	1.05
High Strength Steel		
USS Cor-Ten:		
Standard structural shapes	7.35	0.60
CB sections	7.35	0.60
Plates	7.25	0.525
Bars & small shapes	7.425	0.625
Hot-rolled sheets	6.90	0.525
(Fairless Wks.	6.95	0.525)
Galvanized sheets	9.275	0.675
Cold-rolled sheets	8.525	0.65
(Fairless Wks.	8.575	0.65)
Hot-rolled strip	6.95	0.525
USS Man-Ten R:		
Standard structural shapes	6.00	0.40
CB sections	6.00	0.40
Plates	5.90	0.35
Bars & small shapes	5.875	0.425
Hot-rolled sheets	5.525	0.35
(Fairless Wks.	5.575	0.35)
Hot-rolled strip	5.525	0.35
USS Man-Ten S:		
Standard structural shapes	6.45	0.40
CB sections	6.45	0.40
Plates	6.35	0.35
Bars & small shapes	6.325	0.425
Hot-rolled sheets	5.975	0.35
(Fairless Wks.	6.025	0.35)
Hot-rolled strip	5.975	0.35
USS abrasion resisting:		
Plates	6.00	0.35
Bars & small shapes	6.225	0.425
Hot-rolled sheets	5.825	0.35
Hot-rolled strip	5.825	0.35
Alloy Steel		
Ingots	$74.00*	$5.00*
Blooms, billets, slabs	$107.00*	$11.00*
Hot-rolled bars	6.125	0.55
(Fairless Wks.	6.275	0.55)
Bar & structural shapes	6.20	0.55
Plates	6.85	0.55
Hot-rolled strip & sheets	7.75	0.55
Wire & Wire Products		
Wire rods, carbon: Donora, Cleveland, Joliet & Fairfield	5.80	0.425
Worcester	6.10	0.425
Cold-rolled low carbon strip:		
Cleveland	6.85	0.60
New Haven	7.30	0.60
Worcester	7.40	0.60
Wire—mfrs. coarse, bright low carbon:		
Cleveland, Donora, Joliet, Duluth, Rankin, Waukegan & Fairfield	7.20	0.60
Worcester	7.50	0.60
Premier spring wire —high carbon:		
Cleveland, Donora, Duluth & Waukegan	8.40	0.80
New Haven, Trenton & Worcester	8.70	0.80
MB spring wire—high carbon:		
Cleveland, Donora, Duluth & Waukegan	8.725	0.825
Trenton & Worcester	9.025	0.825
Nails:		
Donora, Duluth, Joliet, Rankin & Fairfield	Col. 167	15
Worcester	Col. 173	15
Polished staples:		
Donora, Duluth, Joliet, Rankin & Fairfield	Col. 167	15
Worcester	Col. 173	15
Wire—merchant quality, annealed:		
Cleveland	8.10	0.60
Donora, Duluth, Joliet, Rankin & Fairfield	8.10	0.60
Worcester	8.40	0.60
Wire—merchant quality, galvanized:		
Donora, Duluth, Joliet, Rankin & Fairfield	8.50	0.60
Worcester	8.80	0.60
Wire—barbed:		
Donora, Duluth, Joliet, Rankin & Fairfield	Col. 187	12
Woven fence:		
Donora, Duluth, Joliet, Rankin & Fairfield	Col. 181	19
Bale Ties:		
Donora, Duluth, Joliet & Fairfield	Col. 195	20
Pipe & Tubular Products		
Buttweld pipe standard & line, black & galvanized—⅛ to 4 in.	$12.00 per ton (discounts reduced 6 points)	
Seamless pipe standard & line, black & galvanized — 2 to 4 in.	$12.00 per ton (discounts reduced 6 points)	
Seamless & electricweld, standard & line pipe, black & galvanized — 5 to 24 in. OD	$11.50 per ton (discounts reduced 5¾-points)	
Electricweld line pipe—26 to 36 in.	$9.50 per ton (discounts reduced 4¾-points)	
Oil country casing, grade J-55 (short T & C, all sizes)	$13.75 N.T.	
Oil country tubing, grade J-55 (upset T & C, all sizes)	$14.25 N.T.	
Drill pipe, grade D, internal (upset, all sizes)	$21.25 N.T.	
(Increases in other grades & types of above pipe mill products are proportionate.)		
Seamless pressure & mechanical tubing:		
Carbon	about 8.5 per cent	
Alloy	about 7.5 per cent	
Stainless Steel		
Mill price bases & extras are increased about 6.25 per cent		

*Net tons

Big Steel in Trouble

U. S. Steel Corp. has been hit hard by strike. All its labor troubles still aren't solved

U. S. STEEL CORP., Pittsburgh, has the dubious honor of taking the hardest knocks in the 1956 steel labor disputes.

Its mills will go back into operation on schedule, but with a new strike in its Pittsburgh Steamship Division, it has a labor problem that is threatening operations as far away as next winter.

Danger—The corporation's ore fleet comprises 58 boats, more than one-fifth of the total Great Lakes fleet. Spokesmen point out: "We have already lost five weeks' ore. Before the strike, our boats were moving some 725,000 tons of ore a week. Each day they're tied up, we lose about 100,000 tons that we should be stockpiling to keep furnaces running next winter."

The corporation's Oliver Iron Mining Division last week had to shut down. It had no more storage space left for ore at its Duluth facilities. The fleet is struck because two independent unions are trying to win representation of its engineers and deck officers. It's against corporation policy to permit supervisory personnel to be union members. If the deadlock lasts, it could end up in Washington.

Record—The corporation's Tennessee Coal & Iron Division, Fairfield, Ala., was struck three times longer than the steel industry as a whole was. It was down 98 days because of a railroad strike.

TCI settled its labor problems Aug. 3. But where most companies will be back to 90 per cent of capacity within two weeks of the return to work, TCI will take much longer. Points out Arthur V. Wiebel, president: "We may have to clean out the blast furnaces. It could be as long as six weeks before the job is completed." The division estimates its losses at 1.2 million ingot tons of steel.

It says that before normal operations can be resumed, its employees will have suffered a direct wage loss of $39.2 million. Another $39.2 million will have been lost by the division's suppliers.

Lathe operator skins a titanium ingot at Republic Steel Corp.'s Canton, O., plant

More Titanium Coming

REPUBLIC Steel Corp., Cleveland, will spend $8 million to boost titanium melting, preparation, forging and laboratory facilities at its Canton and Massillon, O., plants.

The program will increase Republic's output of ingots to some 12 million lb yearly. Products available will be bars, wire, forging billets, plates, sheet and strip. Initial phases of the expansion will be completed this fall. The entire program will take until fall, 1957.

Facilities—Key to the program will be 12 double melt vacuum furnaces. The largest of these will produce an ingot up to 30 in. in diameter, weighing about 8500 lb.

Other equipment to be installed includes: Sponge and scrap processing machinery; electrode preparation machinery; pickling facilities; equipment for grit cleaning sheets; vacuum annealing furnaces; a 3000-ton hydraulic forge press; two car-type heating furnaces and finishing equipment for forged products.

Research—To make room for expanded metallurgical and chemical research and testing, titanium operations will take over office space from other Republic divisions.

C. M. White, Republic Steel's president, points out that while about 95 per cent of U. S. titanium output is going into military aircraft, such civilian markets as the chemical, food processing, pharmaceutical, atomic power, electronic and petroleum industries offer good potential.

Key—The metal's price is the key to commercial use. It has dropped several times in the last few years. Increased production is expected to bring it down still more. Says Mr. White: "We believe titanium has a tremendous future. As the market for titanium expands, Republic Steel will expand with it."

Almost all the new facilities will be at Republic's plant in Canton. They will require approximately 100,000 sq ft of additional building space. However, bar rolling facilities will be added at the Massillon steel plant. The program will be allowed fast tax amortization.

Office Force Negotiates

Unions for white-collar workers are still something of a conversation piece. This company has negotiated with its office force for 14 years. Here are the results

ON MAY 14, five men and four women (all hourly employees of Cummins Engine Company, Columbus, Ind.) sat down at the conference table with E. Don Tull, executive vice president, and R. B. Stoner, vice president-personnel.

They were winding up negotiations on a white-collar labor contract, called an "Office and Research Laboratory Agreement."

The agreement, published in a 41-page booklet, covers all conditions of office employment, spells out management's rights and responsibilities and those of the Office Committee (its nine members are the office employees' bargaining agents).

Set forth are policy and practice on: Wages, job classification and evaluation, seniority provisions, sick leave, pensions, leaves of absence, vacations and holidays, promotions, layoffs, recalls and grievance procedure.

How It Works—The system is informal. About 650 employees are qualified to vote for committee members and are governed by the plan. All hourly paid people, they include stenographers, secretaries, typists, clerks, detailers, draftsmen, laboratory machinists, etc.

The office is divided into "precincts." Employees in each of the nine areas elect a representative to the Office Committee. The committee elects its chairman, vice chairman, secretary and assistant secretary.

Committee members are not paid. No dues are collected, and no one "signs up" to belong to the office group. Management simply recognizes the committee as the bargaining agent.

Each spring, a new contract is negotiated.

Success — Committee Chairman E. L. Riley feels his group has a surprisingly strong voice. He puts much of the credit for this on management's attitude.

Warning against management attempts to use the committee as a tool, Mr. Stoner says: "We're sure if we work with them for our mutual benefit, we'll all prosper. That includes the company."

Cummins' Office Committee members (Edna Kollmeyer, Chairman E. L. Riley and Charles Huffman) meet with R. B. Stoner, vice president-personnel. One direct benefit, improved communications, is obvious

Management - encouraged bargaining for hourly paid office workers at Cummins, started in 1942. The system has succeeded mainly because of management's philosophy.

Board Chairman Irwin Miller told a group of Dartmouth students that the business manager's "first responsibility must be to the people whom he manages." Operating on that basis, executives at Cummins see that the committee has its say in decisions that directly affect office workers.

Plusses—The company has been rewarded. Mr. Stoner cites improved morale among employees: "We have a better understanding of their problems. We're sure they have benefits they never would have won without the committee . . . it helps the employee to know there's an established avenue for his communication with management."

The company feels it is gaining an intangible which all business executives seek: It's the atmosphere that makes employees do their best work, rather than only what is required of them.

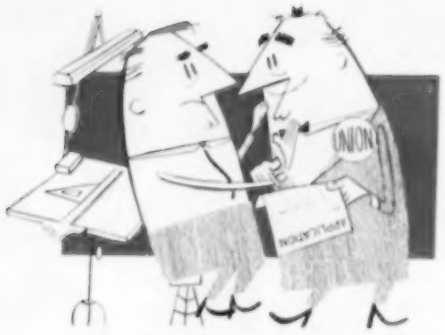
The committee and management meet every month. Management reveals current sales, the status of the order board, keeps the group posted on future plans and discusses current difficulties. It effectively curtails wild rumors, makes employees feel closer to the company.

The committee also is used as a sounding board. On some occasions, where a new policy is to be put into effect, or where working conditions may be changed, executives paint the picture for the committee and get their reaction to it.

Homogeneity—The contract has promoted a homogeneous working group. It has curtailed favoritism in the office. Thorny matters like wages, promotions, special favors and vacations are in black and white.

Many minor grievances are solved by the committee. Others are taken up in regular meetings.

Chairman Riley explains: "Management takes the gripes seriously. Usually, we get action. At least we get answers, and that sometimes is just as important."



Don't Invite Engineers To Organize

1. **When you hire them for technical knowledge and ability, don't assign them to nontechnical duties**
2. **Set up an established salary administration policy. Engineers won't worry about salary inequities if they don't exist**
3. **Encourage loyalty. Give your engineers an opportunity to participate in managerial functions. Make sure that lines of communication with top management are open**
4. **Make sure that you recognize individual effort**
5. **Give more than lip service to personal development. Provide opportunities for individuals to grow**

Engineering Unions Grow

They claim loyalty of one out of every six or seven engineers and scientists. Your company may be the next to be organized. Here's how to check your liability rating

PRODUCTION engineers in Company A felt that the design engineers on the floor above them were getting higher salaries than they were—and vice versa. Research people, a third group in an adjoining building, were exchanging suspicious glances.

Spokesmen of the three departments got together and formed a bargaining unit. When the smoke cleared and the engineers sat down with management to draw up a contract, they found no salary inequities between departments. Few individuals could complain about their salary status within their own departments.

Headache—Company A has another union to deal with annually because of the lack of an established salary administration policy—known and thoroughly understood by the engineers. With it came new headaches in job assignments, transfers, overtime, seniority problems in promotions, layoffs and recalls.

This incident happened shortly after World War II, but the situation was not unique—nor is it now. The lack of effective salary administration is only one factor fostering the growth of engineering unions today.

Record—One of them, the Engineers & Scientists of America, claims it organized 5000 engineers last year. According to ESA's president, Joseph Amann, his organization now represents 50,000 engineers and scientists. The American Federation of Technical Engineers, the other major nationwide union, says it represents another 50,000.

One out of every six or seven engineers and scientists in the country is represented by a union if you add the membership of several independent company and engineering groups to those figures—assuming that the claims are valid. (ESA says 85 per cent of its members has college degrees; AFTE says 60 per cent of its group has them.)

The basic reason for the success of this movement—at least the one the unions play up the most—is rapid technological development.

Cry the unions: Because of this development, engineers have lost their professional status. Collective bargaining will regain it—along with the loss of the salary differential between engineering and production line wages.

Pay Policy—Are your engineers likely candidates for unionization? A good place to start checking is your salary administration. Are salaries uniform throughout all departments for similar duties? Do the engineers know this? Does the engineer know he'll be upgraded in salary and position when he has earned it and an opening is available? Most executives agree that the personal contact of a periodic review—at least once a year—between the individual and his supervisor is the most effective means of communication. It helps the engineer to recognize and improve his weak points, assures him of his progress, recognizes specific achievements and his worth to the company.

How fair is your policy regarding transfers, layoffs, promotions, overtime, special project assignments? If a union gets in, these points will be covered in the contract, and your operating flexibility will probably be reduced.

Extras—What's your policy regarding membership in professional societies and attendance at technical meetings? It's possible to go

overboard to the point of reducing efficiency, but certain individual privileges will pay dividends in increased morale as well as technical knowledge. Many companies specify a certain number of meetings an engineer may attend on company time; some pay part or all the expenses. Membership in some societies is encouraged, with the company often splitting expenses with the engineer.

Status recognition factors are important, too. Do you keep away from the "bull pen" type department when possible? Room partitions are effective when separate rooms or offices are impractical. Special parking areas and cafeteria or dining room privileges help.

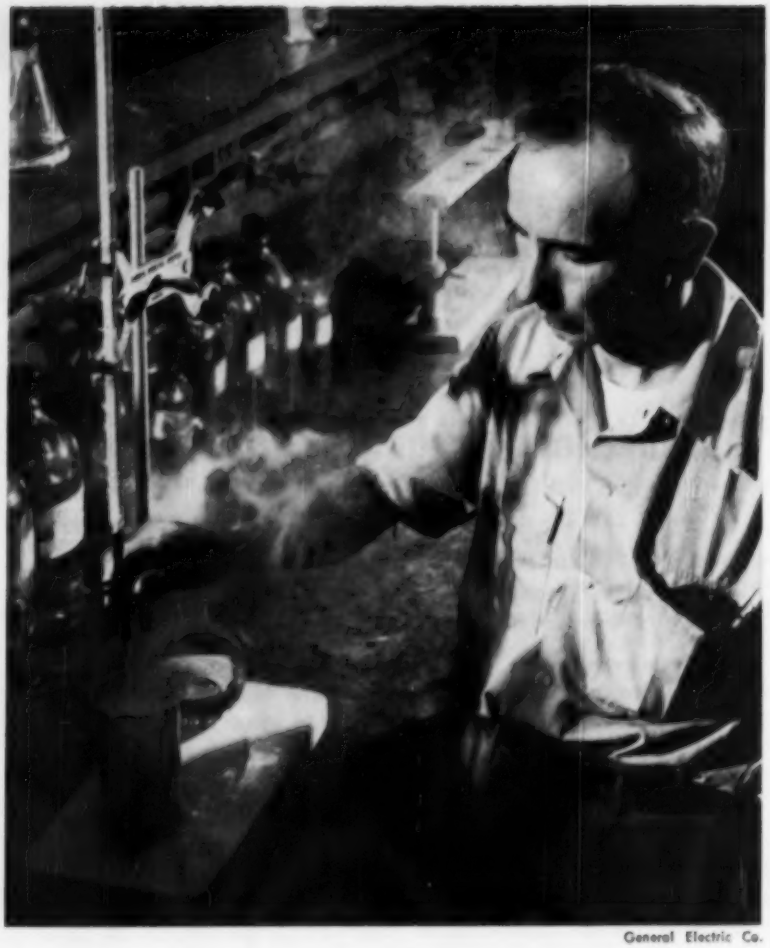
Newsletter — One company is planning an internal publication directed to its engineers. Its format will be similar to that of management newsletters.

A midwest firm is making it a point to see that the engineer gets recognition in news stories for his contribution to a new development or product announced by the company.

Most of the progress in organizing engineers has been made in the aircraft and electronic industries, but the unions have set their sights on all engineers. Officials of the ESA, which is only four years old, expect organization to continue at about its current pace for the next four or five years. "Then it will accelerate much more rapidly, strictly under the momentum of larger memberships."

Management dealing with engineering unions is unanimous: "The unions make management's job infinitely more complex. The average engineer gains little or nothing salarywise; the poor engineer tends to be upgraded slightly, but the top engineer is held back. Any gains at all have been in human relations—periodic reviews, a systematic method of getting action on complaints, established salary policies, better communication with top management, status recognition."

Guide—Those observations suggest the most effective way you can discourage unionization among your engineers: Improve your human relations with them.



General Electric Co.

How To Run Your Research

The scientist in your laboratory may hold the future of your company in his hands. Keeping his services and gaining the maximum return on his efforts are delicate jobs

"RESEARCH is like saving," says one metalworking executive. "If postponed until needed, it is too late to start."

Broad Shoulders — Here's your "ideal" research director:

He's a unique combination of scientist and administrator. An extremely tactful fellow, he can explain the significance of long-haired technical problems to your board of directors, and he senses the delicacies involved in telling a research team that its project is to be abandoned.

On his broad shoulders may rest the future of your company.

The Job—1. He recommends the most profitable lines of inquiry to follow. 2. He estimates the cost of each research project and knows its chances of success. 3. He knows what good can be salvaged from the project should it fail. 4. He breaks the project into component parts for his research teams. 5. He makes progress reports to his superior and expedites communications among his teams. 6. He knows when to stop a project.

"The ability to stop a project (whether it's ready for the pro-

duction line or the scrap heap) is the most vital quality of a good research director," comments one vice president of research.

Expectations—The company has responsibilities to the research director, too. If he doesn't get what he expects from you, you soon may lose his services.

1. The research director should be on a par, salarywise, with the sales manager. 2. He should report to top management levels, not to another division head, such as sales or manufacturing. 3. He should have a free hand in promotions, raises, hiring and firing. 4. His scientific personnel should be directly responsible to him and him only. 5. He should have adequate technical, clerical and secretarial assistants.

A research division, unlike other company divisions, may be the expression of one personality, its director's. There will be plenty of teamwork, but teamwork through the coach, like that of a top football squad.

The Scientist—Once you have a good research director, the secret to success is to give him a free hand with his personnel. The man who goes into the sciences is a different breed of cat. "Financial remuneration, for example, is third or fourth in the list of life's values to these people," notes a director of a nonprofit research center.

The spirit of creative activity in a research division is your research director's main job. If he's good, that spirit will flourish.

Cultural Needs—The spirit needs a special geography, too. One Ohio company recently established its research center in Denver.

Why Denver? It met all the requirements for the right environment: 1. Climate. 2. Proximity to three colleges. 3. Abundance of cultural activities in the city. 4. Diversified recreational facilities. 5. A reputation for good public schools. 6. It's 1000 miles from the home office.

To hold your present scientific personnel or to get new people, you have to offer them more than money, say personnel men who have studied the problem.

Think of your research group as the elite corps of your company. Such treatment pays off.

No Time Clocks—This is a research director's favorite story about a top scientist in industry:

The scientist had been absent from the laboratory for three days, so the director called the man's wife for information. "Why he flew to Chicago last Friday on the midnight plane," she explained. "He remembered a fellow up there who may have the answer to that zirconium problem his team is working on. Didn't he tell you?"

The moral, says the research director: "My men wish they had 30 hours in the day instead of 24. When our projects are challenging, you can't pry anyone away from this organization."

Technical Societies — Your research people must be free to communicate their ideas to other scientists. In return, they will soak up ideas which are new to them.

Technical meetings and the presentation of papers are the traditional hunting grounds for new information. Summer sessions at universities are popular, too.

"To become known as an expert in his field is the scientist's primary goal," believes one research director. "The company that offers him such an opportunity can command his services for as long as it wishes."

Promotions—The truly creative worker wants as few administrative duties as possible. Your research director (part scientist and part administrator) has to iron out the problems of promotions and raises: Unfortunately, promotional pathways for scientists are too often in the direction of administration.

One metalworking company has designated some of its scientists as research associates. It's strictly a matter of title (like assistant and associate magazine editors), but the scheme allows the company to raise the salaries of some scientists without adding administrative duties.

In any case, your research director must see that promotions and raises are strictly on merit. No ambitious young scientist on his first job gives a hoot for seniority. In research, that's as it should be.

Guide for Research Management

DO:

- **Give your research director a free hand with his personnel. Separate your research center from other company facilities**
- **Expect your scientists to operate in teams (the lone genius is the rare exception)**
- **Seek outside research help on specialized problems from private research centers, universities and trade associations**
- **Recognize the personal motivations of researchers**

DON'T:

- **Open a research center without a complete diagnosis of your operations**
- **Mistake trouble shooting for applied research**
- **Think you can have basic research (knowledge for its own sake) on an applied research budget**
- **Expect a scientist to be a good administrator**
- **Use your research center primarily for public relations (it's good window dressing, but you're not getting a full return on your investment)**

Senate Will Play Detective; Steel Distribution Is Suspect

CHALK UP one more investigation of the steel industry. (It also is set for a spotlight role in a fall to-do about prices, wages and profits which will be under the auspices of the joint economic committee.) The latest look-see is by the Monopoly Subcommittee of the Senate Small Business Committee. Sen. Russell Long (D., La.) is in charge. Kicking off the study are complaints by independent fabricators that they cannot get steel on a fair and nondiscriminatory basis from steel companies that are their competitors (through manufacturing subsidiaries). Fabricators say they cannot fill orders. Another charge is that there is no standard allocation system—that neighboring independents may be given different allocation bases by the same mill.

Coming: Anti-Inflation Measures

Commerce Secretary Sinclair Weeks states: "The (steel industry) wage and fringe benefit settlement is substantially in excess of the increased rate of productivity, and if this trend continues long enough, inflation obviously would be the end result." (STEEL, Aug. 6, p. 77.) That could be the tip-off to current administration planning on taxes and credit control. One of the Eisenhower Administration's boasts is that it has been able to keep inflation under control. Tax relief to consumers and/or looser credit will be looked on as inflationary influences. The problem is to keep higher wages and any tax relief from being eaten up by higher prices. It will cause many headaches over the coming months. Results could be an attempt to hold the status quo in taxes and credit, especially if the economy continues in its present robust state.

Ammunition for Steel Producers

At least part of Secretary Weeks's statement is probably based on a study of steel labor productivity by the Labor department. Prior to steel negotiations it was rumored that the report showed productivity was running a poor second to compensation increases. The release of the report, the story went, was being held off until after negotiations ended. Apparently such wasn't the case—or at least findings weren't as bad as they were made out to be. The Labor department says that both sides had advance drafts during negotiations. Public release isn't expected for about another month.

Warehouse Freeze Thaws

Today marks the end of Business & Defense Services Administration's freeze order on steel warehouses. It limited weekly shipments that could be made to individual customers and was aimed at conserving steel needed for defense industries.

Export Controls To Stick

The steel strike is reportedly to blame for a continuation of present requirements and restrictions on export licensing of iron and steel scrap. The Bureau of Foreign Commerce bases the decision on an expectation that resumption of steel production at capacity levels will require record scrap consumption for the remainder of the year.

Prop for Miners

The government's $21-million interim purchase program for domestic tungsten, asbestos, fluorspar and columbium-tantalum is swinging into operation. The productive capacity of some producers was reached largely as a result of defense programs. The aim is to ease them over the hump until a longer range plan can be worked out. One is being prepared by the Interior department.

Washington Whispers

The Pentagon is in the middle on the get-the-government-out-of-business issue. Factions in favor of more action in that direction are looking for Charles E. Wilson, secretary of defense, to get busy now that he no longer has to get congressional approval of such action . . . To get the giant federal highway program under way in a hurry, states have already been advised on how much money they will get in fiscal 1958. The move is aimed at allowing them to make plans. Budget: $1,125 million was apportioned for the first year of the program (fiscal 1957); $2,550 million for fiscal '58.

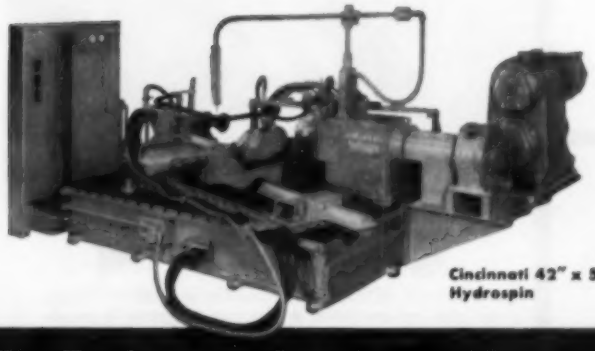
Why remove metal when you can move metal

31" long

into the shapes you want with the Cincinnati Hydrospin

14" high

A wide range of parts can be produced quickly and at low cost by "*chipless machining*" on the Cincinnati Hydrospin. Less metal is wasted and parts have accurate dimensions, high strength and good finish. Let a Process Machinery Division field engineer give you full details. For a description of the process and machine specifications, write for Bulletin M-1873-3.



Cincinnati 42" x 50" Hydrospin

✱ Upper sequence of photos shows *one continuous* tube spinning operation. Starting blank, far left, of SAE 4130 is 8¾" long x 3" I.D. x 0.155" wall thickness. Finished part, shown at far right, Hydrospun in one pass, is 31" long x 3" I.D. with 0.030" wall thickness.

✱✱ Lower sequence of photos shows *one continuous* shear spinning operation. Starting blank, far left, is of type 302 stainless steel, 12" square x ⅛" thick. Finished part, shown at far right, Hydrospun to a 32° included angle in one pass, is 14" high with 0.069" wall thickness.

CINCINNATI **Hydrospin**

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

The Famous Norton G Bond is the most efficient vitrified bond ever developed for precision and semi-precision grinding. Wheels made with it bring you these "Touch of Gold" advantages: Cooler, faster cutting action . . . heavier cuts without burning . . . closer tolerances and smoother finishes . . . easier dressing and more pieces per dressing . . . more work, and more kinds of work, per wheel.

Big surface grinders pay off big

. . . with the G BOND-32 ALUNDUM* combination

Your Big Surface Grinders — like Blanchard, Hanchett, Mattison and Thompson machines—take deep cuts into grinding costs when you use Norton G Bond-32 ALUNDUM wheels or segments. See your Norton Distributor for details. Ask him about other popular Norton abrasives, including 19 ALUNDUM, 38 ALUNDUM and CRYSTOLON* abrasives. Or write to the nearest district office of NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone book, yellow pages. Behr-Manning Company, Troy, N. Y., division of Norton Company. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

W-1717

Norton 32 ALUNDUM Abrasive is another "Touch of Gold" advancement in grinding progress. It grinds exceptionally cool and fast, with minimum dressing, and is ideal for fast stock removal and heavy feeds. The G Bond-32 ALUNDUM abrasive combination is further proof that only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost.

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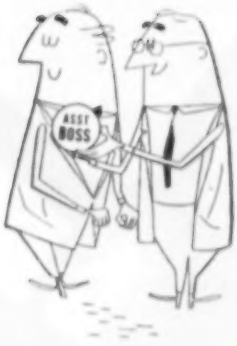


Delegating Authority Aids Kemper

"WE MAKE SOME 40,000 steel and stainless steel fittings a day," states Jackson Kemper, vice president and general manager, W-S Fittings Division, H. K. Porter Company Inc., Roselle, N. J.

"To do this we need: 1. The most automatic equipment available. 2. Team management."

Field Work—This Porter division has some 400 stocking distributors which help it serve the petrochemical, chemical, oil and utilities industries. "The heads of our regional offices form the backbone of our sales management force," comments Mr. Kemper. "They make decisions on who local distributors should be, help solve their problems, etc. My chief concern is that I be kept up to date on what decisions are made rather than being asked to help solve numerous field considerations which can be taken care of by competent regional sales managers."

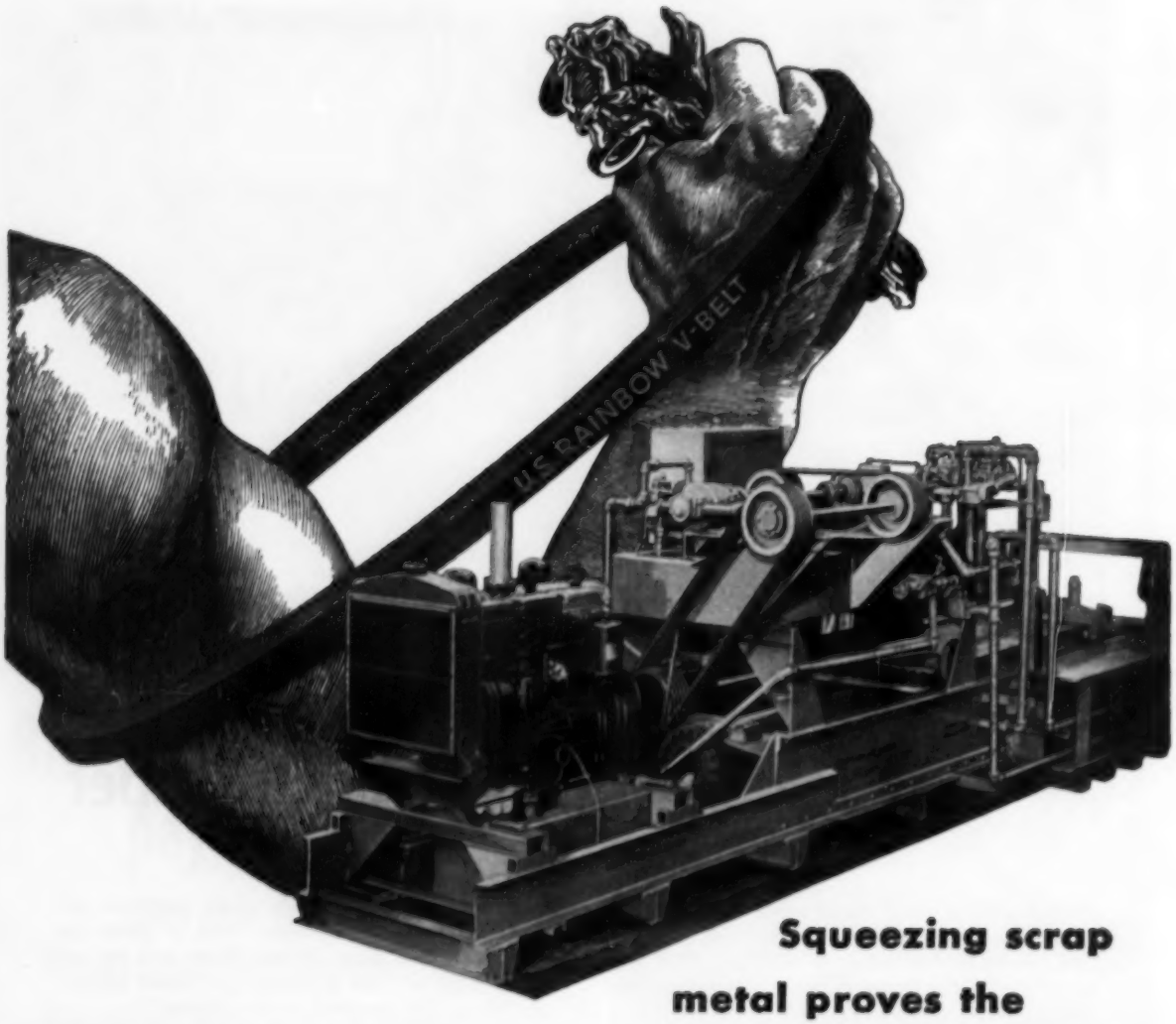
Impromptu Sessions—Sliding glass windows in the partitions between offices in the home plant allow numerous quickie conferences. "As problems come up, we hit them head on," reports Mr. Kemper. Advantages: 1. A solution is reached quickly. 2. A written report is often avoided. 3. Production and distribution snarls can be ironed out in minutes rather than hours.

Another Advantage—"My production men often come to me and explain why we need a certain piece of equipment," says Mr. Kemper. "If they convince me, we sit down together and write up the specifications. But if there are reasons why I must refuse, these men do not waste a lot of time working up a report to submit to me for approval or disapproval."

Committee Approach—W-S Fittings buys all its forgings. It was discovered through team research and discussion that if the number of sources for buying its forgings were reduced from 20 to 5, the fittings division could get better service at less cost than it could obtain by setting up its own forge shop. And quality forgings remain the other fellow's headache, while W-S concentrates on production, sales.

By constantly finding new ways to be of service (this includes the development of new types of cardboard shipping containers which allow the fittings to be more easily and economically handled and warehoused by the distributor), the W-S division is discovering that it can successfully compete in foreign markets. Best foreign customers to date: Canada and Latin America. Explains Mr. Kemper: "We are competing not only on quality but on costs, too."

The former farm boy who worked his way through Hobart College (class of '34) contends: "If we can get out fittings to people faster and in better shape, we can't lose." Proof: Sales prospects are for a 20 to 25 per cent increase over last year's totals.



Squeezing scrap metal proves the "MUSCLE TOUGHNESS" OF U. S. RAINBOW V-BELTS

Many scrap metal dealers use the Dempster-Balester to bale sheet metal into easy-to-handle units. The tremendous power of the machine puts terrific shock loads on V-Belts —U. S. Rainbow® V-Belts. These muscular belts stand up under this treatment because they each have the unique Equa-Tensil Cord Section, a scientifically developed "U. S." construction that brings together in a balanced unit the concentrated strength of multiple pulling cords, distributes the load so evenly among the cords that each carries its full share of the load.

U. S. Rainbow V-Belts have greater gripping power, without slippage, because the straight sidewalls grip the grooves the full height of the belt. Every ounce of excess stretch is worked out mechanically before leaving the factory, yet the belt remains elastic enough to stand heavy shock loads.

U. S. Rainbow V-Belts are obtainable through any of our selected distributors, or any of United States Rubber Company's 28 District Sales Offices, or write us at Rockefeller Center, New York 20, N. Y.

A COMPLETE DRIVE SERVICE

MULTIPLE V-BELTS • F. H. P. V-BELTS • SHEAVES

FLAT BELTS AND BELTING • *POWERGRIP* "TIMING"® BELTS • SPECIAL PURPOSE BELTS

Mechanical Goods Division

United States Rubber

Puerto Rico Hits Jackpot

Commonwealth's drive for American industry is paying off. Federal tax exemption for branch plants established there has proved to be the No. 1 drawing card

"OPERATION Bootstrap" is beginning to roll.

That's Puerto Rico's name for its drive to attract American metalworking and other industries. The latest tribute to its success: American Can Co., New York, will have a $1-million canmaking plant operating in the commonwealth by next spring.

Background—Since the program was started, Puerto Rico has attracted more than 400 new factories. It looks as though continuing success is likely. Reason: The island has special commonwealth status within the American Union. Although in many respects like a state, it has always been outside the federal tax system and has no vote in federal affairs. Result: No federal taxes for American branch plants.

Late last month, John I. Snyder, stateside executive director of Operation Bootstrap, said that Puerto Rico hopes to have 905 branch plants by mid-1963. Its goal for the last fiscal year was 105 plants. It attracted 108. Next year, the goal is 122.

Recent additions include General Electric Co., Schenectady, N. Y., which will set up a light-meter plant near Caguas. Among other new arrivals are United Drill & Tool Co. and Sunbeam Corp., both of Chicago, and the Trumbull Components Division of GE. Union Carbide & Carbon Corp., New York, is getting ready to break ground.

Payoff—Puerto Rico's economists have calculated that the 905 plants forecast for 1963 will directly employ 77,800 workers. "If we follow U. S. Chamber of Commerce estimates of one indirect job for every direct one," says Mr. Snyder, "it will mean that we will have created more than 150,000 industrial jobs in Puerto Rico, supporting a half million workers and dependents."

Dr. Walter K. Joelson, chief economist, attributes the island's gains especially to its "tax holiday" offer to new branches and factories, in addition to the freedom from federal income tax. But he points out that the program excludes "runaway" plants that might shut down elsewhere.

Johnson also credits the expansion to the island's location and transportational facilities, its large labor supply and low labor costs. Another plum: Puerto Rico's government leases factory buildings and makes long-term loans on attractive terms.

Strike Threat Averted

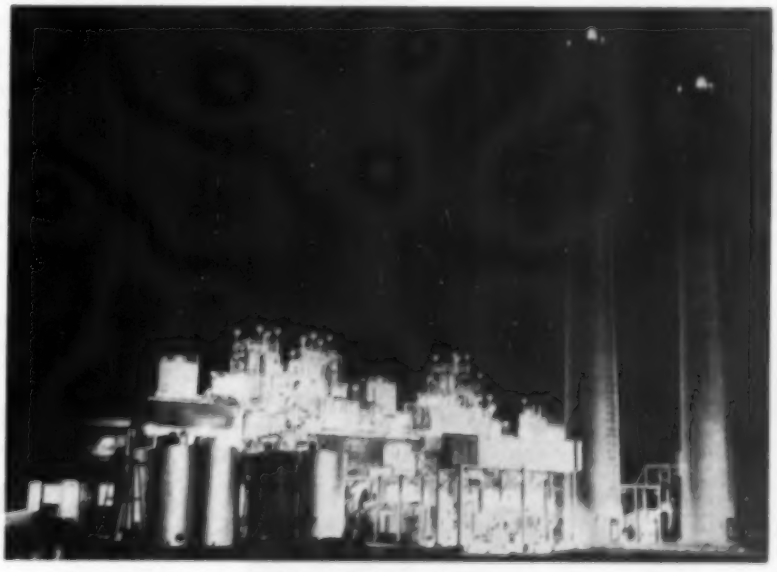
Though British steel mills have managed to fend off the threat of an industry-wide strike, at least for the time being, production is suffering because of the ban on overtime by maintenance workers.

Results show for the first time in June output figures. The average weekly production fell from 412,000 tons for the first five months to 379,700 tons. Up to the end of May, Britain had imported 50 per cent more steel than in the same period last year.

Although the auto industry is cut back to a four-day week, overall steel demand still exceeds supply, though some cancellations have been coming in sheet.

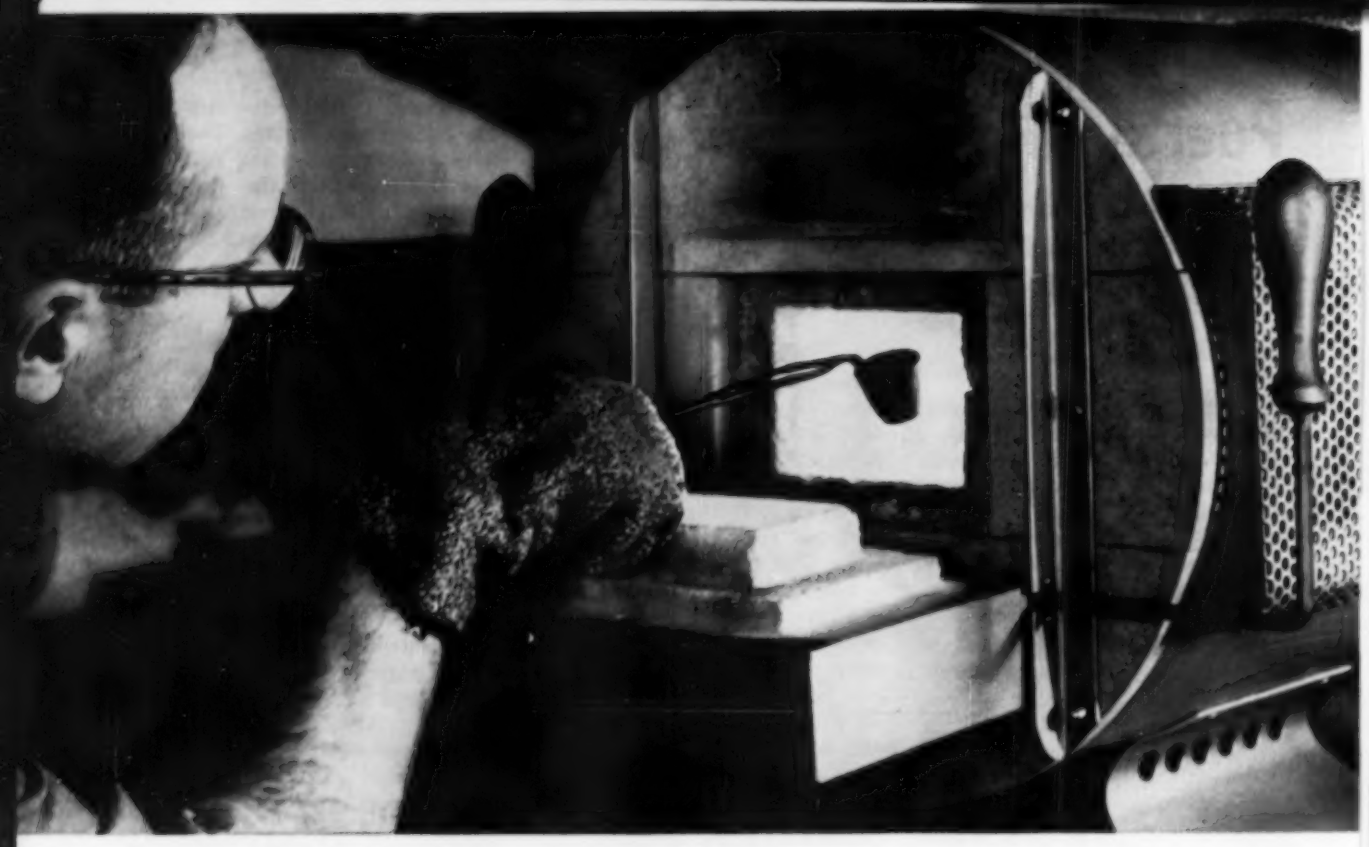
Trade Notes

World Bank makes $75-million loan for 2-million-ton expansion of India's Tata Iron & Steel Co. Kaiser Engineers Division of Henry J. Kaiser Co., San Francisco, is superintending construction of the Tata project. Orders for imported equipment are being placed on the basis of international competition where possible . . . Japan orders four piston and four jet airliners from Douglas Aircraft Co., Santa Monica, Calif. . . . Hyster Co., Portland, Oreg., will add a Brazilian manufacturing plant to its overseas operations . . . American Brake Shoe Co., New York, is establishing a Mexican subsidiary to make brake linings for the automobile, truck and bus trade.



Puerto Rico's No. 1 Power Plant

Producing the power needed to supply Puerto Rico's fast-growing industry keeps round-the-clock pressure on electric generating plants. The capacity of this one at Puerto Nuevo has been doubled. By June, 1959, another $90 million will go for more new equipment



How Great Lakes Steel *blends* quality

COKE OVENS eject tons of flaming, quality controlled coke into cars for rapid delivery to quencher. Then . . .

SAMPLES ARE ANALYZED carefully to determine the amount of sulphur in the coke used in the blast furnaces.

Take five kinds of carefully selected soft coal. Blend well. Bake in a 2500° oven for 15½ hours. And if every step has been checked and double checked, the way it is at Great Lakes Steel, *presto!* You get pure, hard coke—the vital ingredient for reducing ore to high-quality pig iron.

Above, you see Great Lakes special coke recipe (cut in millionths, of course) being checked for ash impurities, a very important step in the complete analysis.

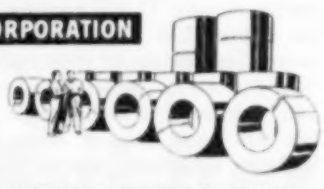
First, a sample of each kind of coal is burned to a cinder in the test furnace. Then the painstakingly mixed blend gets this dress rehearsal heat treatment, too. And this makes doubly sure that the blast furnaces produce quality iron . . . iron to make steel that meets customer specifications *to the letter!*

Quality control from raw materials to finished product—that's Great Lakes Steel! May we help you?

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION



District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

Sculptured Steel Sets Trend

Tomorrow's cars will get new look from an old concept. Made from drawings by George Walker, Ford's vp-styling, these sketches trace styling progress since the Model-A

SCULPTURED steel will get a big play on new models.

There are as many definitions of this styling concept as there are stylists and designers in Detroit. Here's how some experts describe it:

Definitions—In sculpturing steel or any other metal, stylists say, you draw and stamp it into shapes and forms which break up the monotony of large surfaces. This eliminates a lot of gimcracks which only clutter up the sleek appearance of modern autos, they assert.

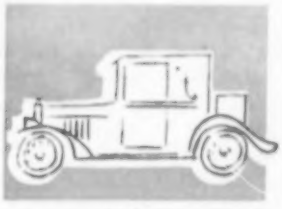
William Schmidt, vice president of styling, Studebaker-Packard Corp., puts it this way: "Sculptured steel means doing with basic sheet metal what usually is done with trim molding and paint." George Walker, Ford's vice president of styling, explains: "Sculptured steel bodies give fluidity of motion; a crispness of style." Richard Sinko, executive assistant to Chrysler's styling director, Virgil Exner, adds: "It places the accent on shapes and forms rather than on applied trim."

History—Early cars looked like boxes. Mr. Walker's sketches show how edges and lines were square. They had little eye appeal. The first sculptured effects came when auto makers started to curve fenders so they flowed over wheels. Roofs were rounded next. Then came teardrop fenders and the bullet shapes of the late '30s and '40s.

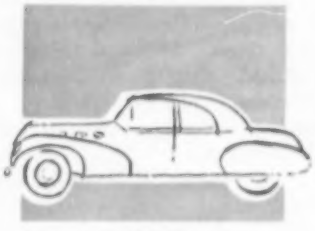
Following World War II, designers swung back toward simple classic lines, but added a feeling of motion to cars. Chrysler calls it the Forward Look. Fenders and hoods were formed to look like a single sheet of steel. The shape of panels began to give contrast and style. Decorative trim strips started to blend into these lines. In some places (sill moldings, for example), they disappeared entirely.

Items—These clean sculptured shapes are found today in the depressed panels on Studebaker Hawk doors, the long sweep line on the sides of Lincolns (no chrome rubbing strip required) and on the ribbed roofs of Chevrolet station wagons.

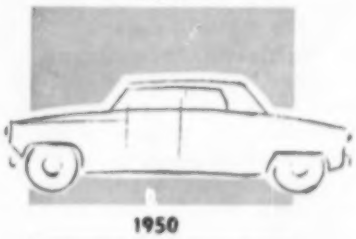
Next year, several cars will have



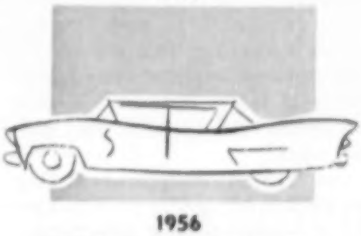
1931



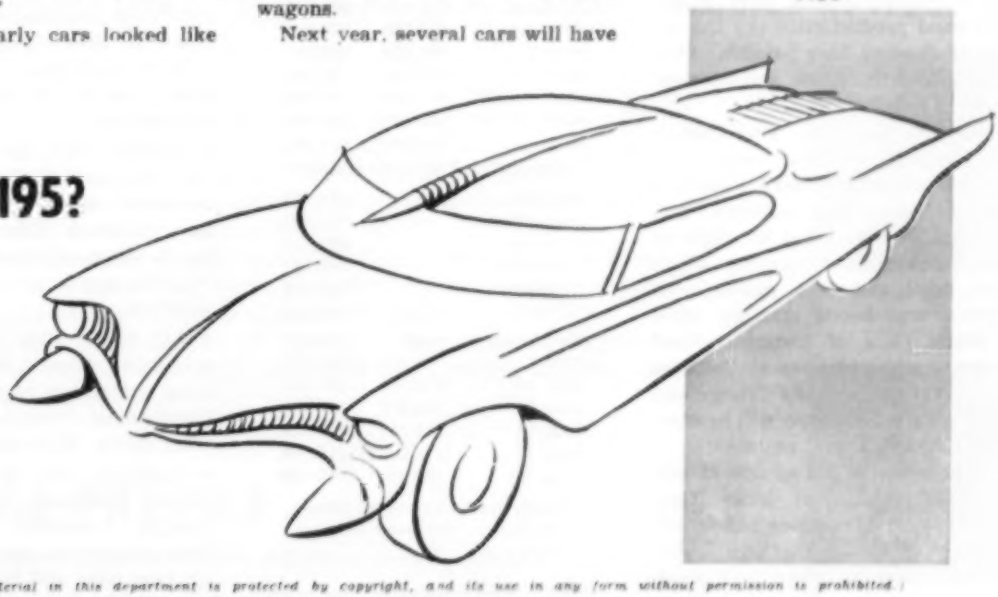
1939



1950



1956



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ridges stamped into their roof and deck panels. Tail fins will sweep back in concave curves from front fenders. Wheel wells will be flashed back on some models. Ultimate aim: To build a body shell so well integrated that it looks like it is sculptured from a single piece of steel; it will have enough planes and surfaces to prevent it from resembling a box or cylinder.

Dreams—That's the styling side of tomorrow's cars. Ralph Bidwell, tool consultant for the body section of Chrysler's engineering division, declares: "We sometimes call sculptured shapes a diemaker's nightmare. The complexity of shapes makes diemaking difficult and expensive."

Up to two or three years ago, quarter panels were stamped out in two parts and welded together. Most auto makers now use folding dies which draw them out as a single piece. Such methods can increase tooling costs 8 to 10 per cent for a quarter panel, says Mr. Bidwell. The savings on welding time don't make up for it.

Race—So far, improvements in stamping presses, die lubricants and body steels have enabled manufacturing people to keep up with styling demands. "It's still a balance between stylists' conceptions and what is practical from a mass production standpoint," Mr. Bidwell adds.

One reason sculptured styling has proved so popular with foreign car designers is that low volume and hand production make the intricate flowing lines possible. "We can't afford to do that sort of work here," he claims.

Tilt—It won't be long before stylists will ask for more than can be met with today's materials and manufacturing methods. Mr. Schmidt declares that by 1960 or 1965, cars will be sporting wrap-over hood and deck panels with fenders and hoods stamped from a single piece of material. Roof doors, now experimental features on Mercury's Turnpike Cruiser and the Packard Predictor, will be common. So will swivel seats.

"The main points of accent will be roofs, hoods and decks. Cars will be so low that side panels will require little or no trim," Mr. Schmidt asserts. Trim and molding strips well may be sacrificed to sculptured designs. Chrysler already has found that color, another tool for achieving contrast, is trending back toward single shades. The three-tone fad is passing, reports the company.

Needs — All this means more technological developments, say engineers. It's likely that more malleable steels must be found. Rubber dies and cam dies may find increasing use in stamping plants.

Larger, intricately shaped body panels can cut assembly costs, but will make for more material handling problems. Chrome and aluminum may lose out in trim strips, but those materials will have to be adapted for use elsewhere on bodies. Sculptured styling is on the move.

Auto Earnings Slip

Ford Motor Co.'s net earnings were $131.7 million in the first half. They compare with $234.4 million last year; $137.6 million in the first half of 1954.

Consolidated sales for the same period were almost 20 per cent down from 1955's, but 6 per cent higher than those two years ago. Sales brought in $2.4 billion, compared with $2.9 billion in 1955 and $2.2 billion in 1954's first half.

Ford's first half payroll amounted to $498.5 million, second only to last year's $538.6 million for the same period. Average employment was 177,168, compared with 178,438 last year. Hourly employees worked an average of 39.3 hours a week. Earnings averaged $93.09 a week.

Competitor — Chrysler Corp.'s first half sales came to $1.4 billion, compared with $1.8 billion last year. Consolidated net earnings were $18.7 million, against $70 million in the same period of 1955.

First half earnings were equal to 1.31 per cent of sales, Chrysler reported. Last year, the percentage was 3.71. GM's earnings were reported the week before last (STEEL, July 30, p. 64).

Production—Ford's seven-month production total for cars and trucks came to 1.2 million units. GM built 2.2 million units and Chrysler 602,317 units. Last year, these totals were 1.5 million, 2.7 million and 951,323. GM's figures do not include Canadian operations.

U. S. Auto Output

Passenger Only

	1956	1955
January	612,079	659,508
February	555,596	675,495
March	575,234	794,015
April	547,766	753,851
May	471,533	724,892
June	430,279	649,393
July	448,804†	659,763
7 Mos. Total	3,641,291†	4,916,917
August		614,493
September		461,591
October		517,813
November		749,061
December		682,257
Total		7,942,132
Week Ended	**1956**	**1955**
July 7	68,110	134,092
July 14	112,361	167,473
July 21	113,416	196,434
July 28	111,247	161,370
Aug. 4	110,793†	140,788
Aug. 11	107,000*	149,199

Source: *Ward's Automotive Reports*

†Preliminary *Estimated by STEEL

Exhaust Notes

• General Tire & Rubber Co. announced a dual tread tire (the Dual 90) with a groove in the middle. This tubeless model is supposed to give the effect of two tires on each wheel. It's an overgrown version of racing tires for motorcycles.

• Rumor: Chrysler is acquiring land in northeast Detroit for a technical center and administration buildings. The right of way for a superexpressway may cut into the company's present headquarters.

• AC Spark Plug Division, GM, announces it has a $9.8-million defense contract to repair and modify navigational instruments for aircraft in its Milwaukee plants.

• Goodyear Tire & Rubber Co., Akron, dedicated its plant at Los Guayos, Venezuela. Tire production started last month. Industrial oil hose also will be made there.

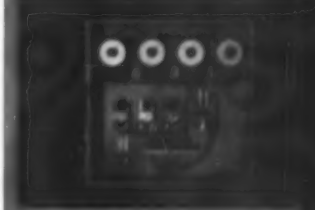
the *CLEARING ROBOT* that's setting records at HOTPOINT

Here's a Clearing high speed press that's making steel confetti fly at Hotpoint's Home Laundry plant in Chicago. Each piecepart has 5,000 perforations which are grouped in three different locations. The press operates at a speed range of 125 to 250 strokes per minute and "thinks" for itself in the matter of locating the hole groupings and the number of holes which is correct for each grouping.

The result is a finished part from which the cylinder of a dryer basket is made. It's a result that gives Hotpoint accurate parts, produced economically with a minimum of material handling.

If there is a place for one of "Speedy's" energetic and thoughtful brothers in your manufacturing plans, call on a Clearing sales engineer to talk the problem over.

Hotpoint dryer basket after it has been perforated and rolled into its cylindrical shape.



Part of the electronic brain that tells "Speedy" when to start and stop and where to locate the perforations.

CLEARING PRESSES THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION • *Division of U.S. INDUSTRIES, INC.*

6499 W. 65th Street, Chicago 38, Illinois • Hamilton Plant, Hamilton, Ohio

Prehistoric monster?

No. You're looking at the *world's largest dredger* . . . a hungry man-made monster of a machine that can move a mountain of earth in a day.

Imagine the brute power it takes to move this behemoth—even more, the joint-strength it needs to hang together despite the strains and stresses it undergoes! It typifies what's been happening in the earthmoving equipment field. They're making them bigger, more powerful, more rugged.

What helps hold such hard-working equipment together?

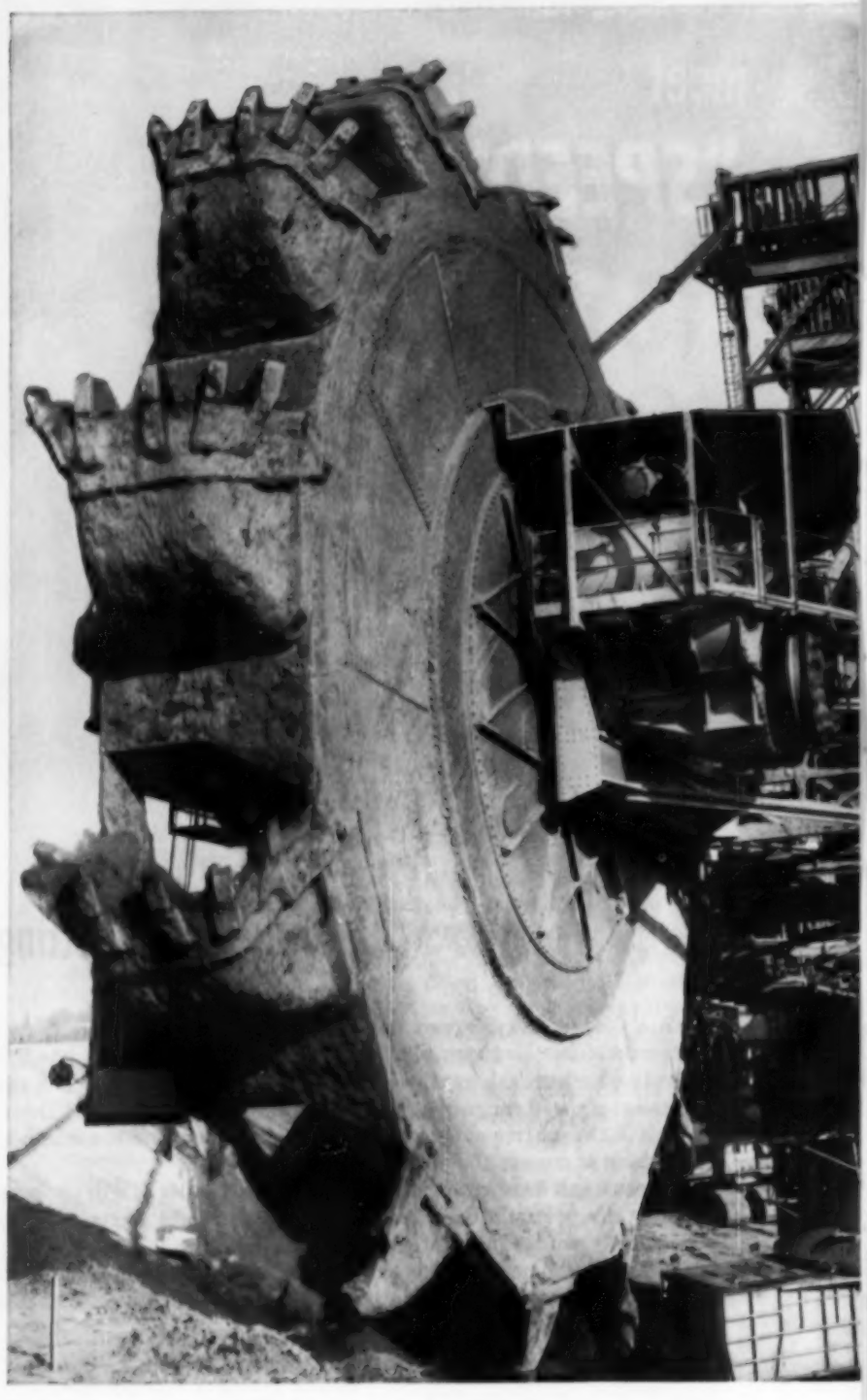
Plenty of standard *nuts and bolts*. They have to be strong and flawless, these fasteners . . . completely reliable.

RB&W—A MAJOR AND RELIABLE SUPPLIER

A leader for 111 years, RB&W turns out the finest quality fasteners possible—for the heavy equipment field as for so many other major fields in industry. *Modern facilities, new techniques, long experience* . . . all combine to make RB&W fasteners truly the "strong point of any assembly".

CONTACT THE RB&W "FASTENER MAN"

Proper application of standard fasteners can save you money. Ask the RB&W "Fastener Man" to show you how. Contact your nearest RB&W office.



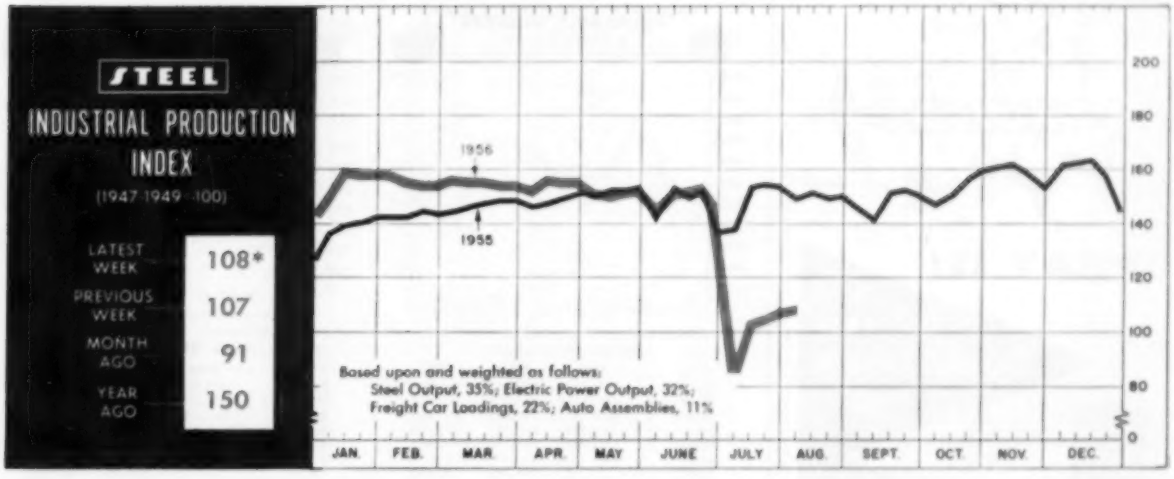
R B & W

111th year

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors from coast to coast.**

RB&W FASTENERS - *Strong Point of any assembly*



*Week ended Aug. 4

Steel Settlement Triggers Price Spiral

THE PRICE CLOUD has finally opened up. Dribbles being felt now represent only the shower before the squall.

The basic reason behind this price weather is the increased cost of raw materials, including labor. Count the new wage contract in steel as a major force.

Out the Window—Over the past year, much has been made of price stability, both wholesale and consumer. In the face of rising costs, they have remained fairly level, mainly because manufacturers and merchants have absorbed much of the increase. But the general feeling is they have gone about as far as they can and now must give in to the inflationary spiral.

A hint of what's coming has been given by the appliance industry. Price tags have been boosted as much as 10 per cent by most producers of automatic washers, dryers, refrigerators, radios, television sets and other big appliances. This began even before the strike settlement—in anticipation of higher steel prices. Now that those prices have been announced (an average of $8.50 a ton; see page 49) the real upsurge in the cost of living won't be far behind.

Index Will Rise—The Bureau of Labor Statistics' wholesale price index stood at 114.2 (1947-1949 = 100) in June. That's 0.2 percentage point down from the high mark set in May. From now until the end of the year, the only direction the index will take is up. July will show a slight increase, with a larger increment showing up in August. When new automobiles, with their higher prices, start coming out, the upturn will shift into high gear. Because some models will not appear until late 1956 or early 1957, an advance in the index will be noticed even six months from now.

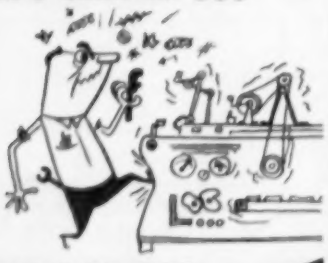
Consumers' prices will keep nearly in step. In the past, this index has been slower to reflect price increases because the merchant is caught between higher costs and the buyer's natural re-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,290[1]	415	2,157
Electric Power Distributed (million kw-hr)	11,400[1]	11,295	10,925
Bituminous Coal Output (1000 tons)	9,025[1]	9,000	9,601
Petroleum Production (daily avg—1000 bbl)	7,100[1]	7,086	6,639
Construction Volume (*ENR*—millions)	$309.5	$396.9	$317.7
Auto, Truck Output, U. S., Canada (*Ward's*)	141,101[1]	144,003	170,004
TRADE			
Freight Car Loadings (1000 cars)	650[1]	650	765
Business Failures (Dun & Bradstreet)	274	223	201
Currency in Circulation (millions)[3]	$30,575	$30,632	$30,236
Dept. Store Sales (changes from year ago)[3]	−1%	+2%	+13%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,627	$21,626	$20,479
Federal Gross Debt (billions)	$272.6	$272.9	$277.2
Bond Volume, NYSE (millions)	$20.4	$17.8	$17.4
Stocks Sales, NYSE (thousands of shares)	11,657	10,549	10,543
Loans and Investments (billions)[4]	$84.5	$84.9	$84.9
U. S. Govt. Obligations Held (billions)[4]	$26.1	$26.3	$32.2
PRICES			
STEEL's Finished Steel Price Index[5]	210.45	210.45	207.63
STEEL's Nonferrous Metal Price Index[6]	261.1	261.1	241.1
All Commodities[7]	114.2	114.1	109.8
Commodities Other Than Farm & Foods[7]	121.5	121.4	116.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

DON'T SAY IT ...



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a clean, dry, dust-free

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(Metallic or Non-metallic)

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Dries in 30 minutes • Use on metallic or non-metallic parts • Use with or without oil or grease • Lubricates in temperatures from −300°F. to +500°F. • Excellent for high loads & high speeds

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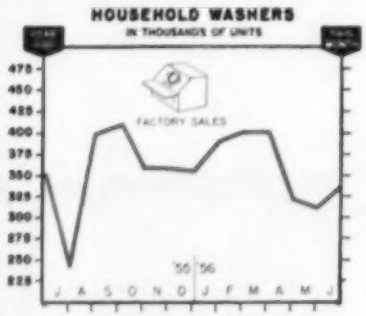
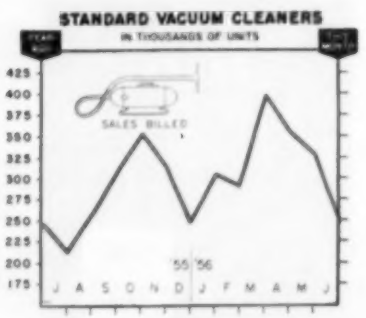
THE BUSINESS TREND



Factory Sales—Units

	1956	1955	1954
Jan.	393,717	357,354	249,956
Feb.	405,631	353,214	295,171
Mar.	406,744	370,555	307,862
Apr.	324,238	313,461	258,712
May	315,249	341,759	246,944
June	346,235	354,470	303,455
July	.....	245,879	242,863
Aug.	.....	403,770	293,243
Sept.	.....	414,919	379,666
Oct.	.....	362,335	339,169
Nov.	.....	361,341	308,368
Dec.	.....	357,503	264,803
Totals ...	.....	4,236,500	3,490,212

American Home Laundry Mfrs. Assn.



Sales Billed—Units

	1956	1955	1954
Jan.	302,203	248,941	221,233
Feb.	286,386	281,183	199,035
Mar.	395,686	356,444	276,484
Apr.	352,873	241,870	220,849
May	326,005	255,941	200,434
June	248,326	239,728	195,761
July	.....	206,758	193,607
Aug.	.....	252,691	185,397
Sept.	.....	306,507	238,235
Oct.	.....	349,654	263,197
Nov.	.....	307,287	237,882
Dec.	.....	243,457	217,022
Totals ...	.....	3,270,441	2,658,136

Vacuum Cleaner Mfrs.' Assn.

Charts copyrighted, 1956, STEEL

sistance to paying more. With wages on the uptrend, this resistance will soften, making it easier for the merchant to pass on some, if not all, the added expense.

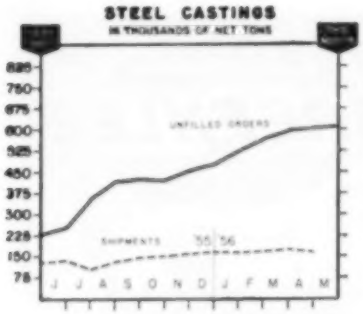
Consumers Still Spending

The consumer is still in a spending mood, despite the steel strike. Department stores continue to show sales increases over year-ago periods with the exception of the last week of the shutdown. Considering the cool, wet weather covering a large part of the nation during that time, it is doubtful that the strike was the only factor in the decline. In many steel cities, merchants offered to carry customers "on the books" until pay checks start coming in again. This may result in a small increase in total consumer debt in July and August. The government says total consumer installment obligations rose to $28.9 billion in June. The rate of climb this year has not been as fast as in 1955.

A continuing tightness in money will have a further retarding effect on the rate of indebtedness over the rest of the year. New York bankers feel that loan demand for the rest of this year will overbalance money supply. Demand from business borrowers is especially heavy. Clarence M. Turley, president of the National Association of Real Estate Boards, claims that expansion of capital demand in the business community has sharpened competition in the money market and has lessened loan resources available to home builders and buyers. "Despite the ability of American families, who now enjoy full employment and unprecedented income, to afford higher quality shelter, opportunity to exercise purchaser choice is being curtailed," he says.

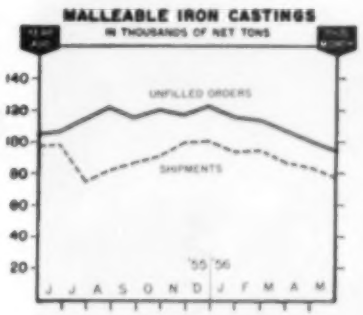
Index Begins Recovery

Industrial production, which showed little sign of weakness during the steel strike, may run into some trouble before the supply pipelines are refilled. But it won't be enough to disturb STEEL's industrial production index as it heads toward prestrike levels. From a preliminary reading of 108 for the week ended Aug. 4 (1947-1949 =100), it will move up close to the 125 mark the following week on the basis of resumed steel operations alone. A gradual pickup in freight car activity will reinforce



	Shipments		Unfilled Orders*	
	1956	1955	1956	1955
Jan.	158.7	98.2	519.4	201.8
Feb.	165.4	106.4	567.3	202.3
Mar.	179.0	127.5	595.0	215.1
Apr.	163.7	120.1	600.2	221.3
May	178.2	122.5	608.3	226.3
June	....	133.9	....	261.4
July	....	97.8	....	254.6
Aug.	....	128.4	....	413.5
Sept.	....	140.8	....	420.6
Oct.	....	148.7	....	418.1
Nov.	....	152.4	....	453.1
Dec.	....	159.0	....	478.3
Total	....	1,530.7		

*For sale. U. S. Bureau of the Census



	Shipments		Unfilled Orders*	
	1956	1955	1956	1955
Jan.	93.6	82.0	116.5	99.8
Feb.	93.5	86.0	113.6	101.6
Mar.	86.9	102.4	106.5	99.7
Apr.	83.3	101.2	99.6	104.1
May	80.1	98.6	93.7	106.4
June	....	99.5	....	107.6
July	....	75.6	....	116.4
Aug.	....	82.4	....	123.4
Sept.	....	87.2	....	116.6
Oct.	....	90.9	....	121.3
Nov.	....	99.3	....	117.0
Dec.	....	99.9	....	123.1
Total	....	1,104.8		

*For sale. U. S. Bureau of the Census

the recovery during the next two or three weeks, and greater use of electric power by the steel mills will have a good effect.

The only element which will prevent the index from reaching second quarter heights is automotive production. Model change-over has already started for some makes, with most of the major shutdowns scheduled for the last half of August. A complete shutdown of the auto industry would mean a loss of about 12 points in the index, based on recent operations. When new model production gets into full swing during fourth quarter — about 1.7 million units will be turned out — the index will recover to full strength and possibly top the high mark of 163 set in the week ended Dec. 10, 1955.

Appliances Revive

The appliance industry is beginning to show signs of recovery from its contraseasonal slump. Homer L. Travis, vice president of sales, Kelvinator Division, American Motors Corp., says home laundry appliance sales will reach a record 6 million units this year and even more in 1957. Factory sales of household washers (see chart, page 68) are running 4.5 per cent ahead of last year's, and home laundry equipment in general is about 6 per cent ahead. Vacuum cleaners are 19.2 per cent ahead of year-ago figures (see chart, page 68).

Radio and television set sales are picking up for two main reasons: Some set manufacturers going out of business are clearing their stocks at attractive prices; political conventions are a better sales gimmick than the best advertising brains can think up. Both sales and production in June came close to setting records, and July and early August should see further improvement.

Now all the appliance people need is some 100°F weather to help clear their stocks of air conditioners. They are a drug on a cool market.

Miniaturization Grows

Miniaturization is becoming big business. The Micronics Division of Elgin National Watch Co. originally set a volume goal of $25 million for its first three years in the business. Projected volume on contracts let in the first six months alone amounts to $20 million.

PRODUCTION MACHINERY

GREENLEE

Simplified

CROSS-SLIDE CAMMING

ON GREENLEE BAR AUTOMATICS

Gives You Greater Flexibility...Saves Setup Time

CAMS ARE INTERCHANGEABLE

CAMS ARE SMALL, EASY TO HANDLE

CAMS HAVE UNIFORM HIGH-POINT

Greenlee simplified camming results in simplified, fast setups. Operation is economical and efficient . . . especially so on short runs. Each cross slide operates independently by a separate cam . . . long operations are easily split up for greater flexibility and more effective use of machining time. On a Greenlee your investment in cams is held at a minimum . . . the same cams can be used on any cross slide. Greenlee engineers will be glad to show you how to reduce profit-stealing setup time on the simplified Greenlee. Take advantage of this valuable service now.

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PRODUCTION MACHINERY

GREENLEE

GREENLEE BROS. & CO.
1928 Mason Avenue
Rockford, Illinois

E. A. WILLIAMS
. . . Loud Machine Works v.p. & g.m.

E. A. Williams was appointed vice president and general manager, at **H. W. Loud Machine Works Inc.**, Pomona, Calif. He was night superintendent of fabrication, Lockheed Aircraft Corp., Burbank, Calif.

Paul Jones was made works manager of the **Borg & Beck Division** of Borg-Warner Corp., Chicago. He was plant manager, Utica division of the Bendix Aviation Corp.

G. H. Jackson, vice president in charge of purchasing for **Modine Mfg. Co.**, Racine, Wis., also has been named in charge of manufacturing for the company's four plants.

Mount Vernon Co., Mt. Vernon, O., appointed **James G. Blessing** general manager of its Mount Vernon Bridge Co. Division. His new duties will be in addition to his position as vice president.

Allen Mfg. Co., Hartford, Conn., named **George Ullring** assistant sales manager.

E. R. Pettengill was elected director of co-ordination-manufacturing and distribution on the sales staff of **Pontiac Motor Division,** Pontiac, Mich., General Motors Corp. He was administrative assistant to the general manager.

HARRY J. MOORE JR.
. . . IBM director of purchasing

Harry J. Moore Jr. was named director of purchasing, **International Business Machines Corp.**, New York. He succeeds **William L. Lewis** who retires as vice president in charge of purchasing.

Burton R. Buck was appointed vice president of **Electro Metallurgical Co.**, a division of Union Carbide & Carbon Corp., New York. He was works manager.

William B. Albrecht was made vice president-engineering and development at **Super Steel Products Co.**, Milwaukee.

Industrial Nucleonics Corp., Columbus, O., appointed **William E. Van Horne,** formerly sales manager, to the new position of general sales manager.

Harold F. Bishop joined **Exomet Inc.**, Conneaut, O., as technical director. He was associated with the Naval Research Laboratory, Washington.

Emmett D. Quan was appointed assistant to the vice president-manufacturing of **Pullman-Standard Car Mfg. Co.**, Chicago.

W. S. Sease was appointed sales manager of the oil tool division, **Chicago Pneumatic Tool Co.**, with headquarters at the Ft. Worth plant. He was a regional sales manager.

JOHN D. GORDON
. . . Progressive Welder v.p. & g.m.

John D. Gordon was elected vice president and general manager at **Progressive Welder Sales Co.**, Detroit. He was sales manager.

Inland Steel Co., Chicago, named **Derrick L. Brewster** assistant general manager of sales and **John Strome** to succeed him as manager of the Chicago district office.

Philias H. Girouard, chief engineer, U. S. Navy Bureau of Ordnance, was appointed assistant director of engineering at **Consolidated Electrodynamics Corp.**, Pasadena, Calif.

Harry W. Finney was made division superintendent of the Saxonburg plant of **U. S. Steel Corp.**, Pittsburgh. He was assistant superintendent-blast furnace department.

W. C. Heath was named to the new post of projects manager in **Solar Aircraft Co.'s** San Diego plant. He was executive engineer-marketing.

Fred W. Boynton was made industrial product sales manager in the Great Lakes sales region, **Reynolds Metals Co.**, Louisville, with headquarters in Detroit.

D. F. Jurgensen was appointed to the new post of vice president-development and research, **Blaw-Knox Co.**, Pittsburgh. He was di-

ROBERT E. WILLIAMS
. . . U. S. Steel dir. of distribution

DONALD SAUNTER
. . . Dodge Mfg. dir. of prod. & pur.

RAY W. HERMANSON
. . . Wright Tool & Forge sales mgr.

rector of engineering and development at Congoleum-Nairn Inc.

Robert E. Williams was made director of distribution and availability of **United States Steel Corp.**, Pittsburgh. He was assistant vice president-sales at the Columbia-Geneva Steel Division of U. S. Steel.

Yale & Towne Mfg. Co., Philadelphia, appointed **Richard C. Slater** assistant gas truck sales manager; **Walter S. Maranuk**, manager of the Pittsburgh sales and service branch; and **Frank Boufford**, western regional sales manager.

George H. Rehling was named vice president of **Wyckoff Steel Co.**, with headquarters at Dayton, O.

Weber Aircraft Corp., Los Angeles, appointed **Arnold Johnson** senior vice president and **Fred Godfrey** vice president-manufacturing.

Jack Smith was named director of the air control and research department of **Kaiser Steel Corp.'s** Fontana Works, Fontana, Calif.

Appointments to the staff of **Chrysler Corp.'s** automotive group include: **Fred M. Glassford**, manufacturing director; **B. W. Bogan**, executive engineer; **William G. Knuff**, director of forward planning; **Jack Freeman**, chief operations analyst; **Carl W. Layman**, chief industrial engineer; and **H. Haild Zeder**, manufacturing specialist.

Donald Saunter was promoted to director of production and purchasing at **Dodge Mfg. Corp.**, Mishawaka, Ind. He was in charge of special assignments for vice president-production and purchasing.

George C. Wilsher was made vice president-engineering of **Holcroft & Co.**, Detroit. He has headed the engineering department since 1945.

Arcrods Corp., Sparrows Point, Md., elected **E. B. Lutes** vice president-engineering and **L. G. Marini** vice president-production.

Aluminum Co. of America, Pittsburgh, appointed **William A. Weber** assistant general traffic manager. He was manager of Gulf operations of Alcoa Steamship Co.

R. R. Allen was named vice president and director of engineering and research for the **John Wood Co.**, Conshohocken, Pa.

Burnham Corp., Irvington, N. Y., made **Joseph Pearce** purchasing agent for all its divisions.

Douglas Munroe was appointed assistant to the executive vice president of **Anaconda Co.**, New York.

John F. Scott was named district manager in Milwaukee of **U. S. Steel Supply Division**, U. S. Steel Corp. Formerly assistant district manager, he succeeds **Carl Gallauer Jr.**, retired.

Ray W. Hermanson was named sales manager of **Wright Tool & Forge Co.**, Barberton, O. He was associated with Brea Chemicals Co. and Tubing Appliance Co. in Los Angeles.

A. O. Smith Corp., Milwaukee, appointed **Walter H. Porth** an assistant to the president. Succeeding him as director of the company's international division is **G. J. Pateneaux**, former assistant director.

C. R. Northey was made manager of Hart avenue plant, Detroit, of **Bower Roller Bearing Division** of Federal-Mogul-Bower Bearings Inc.

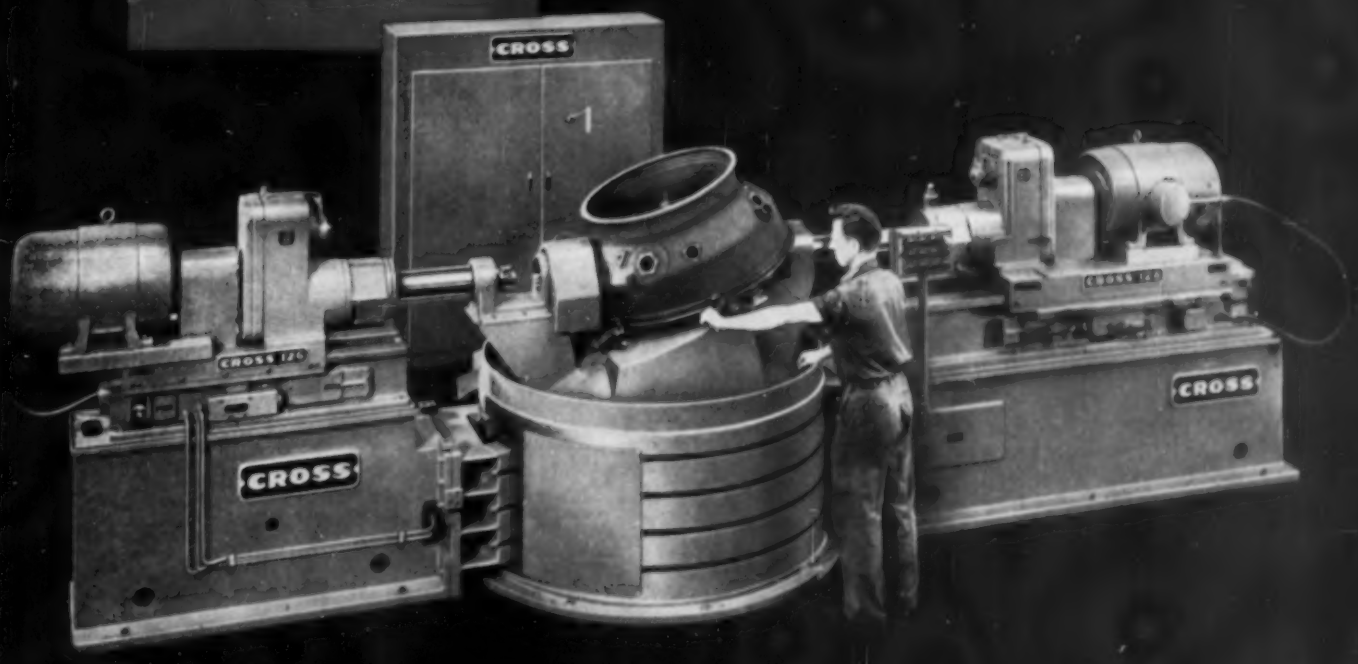
Robert T. Samuel was appointed assistant sales manager of **International Business Machines Corp.**, New York. Succeeding him as regional sales manager for sales districts in the eastern half of the U. S. is **Charles Benton Jr.**

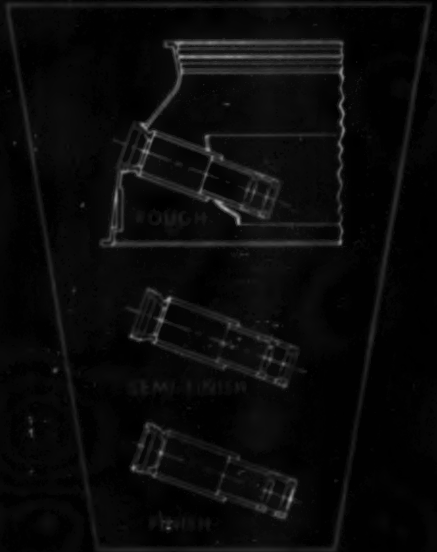
Motor Wheel Corp., Lansing, Mich., named **Alexander Brede** director of new product development. He succeeds **Charles R. St. Clair**, resigned.

Carl W. Millsom Jr. was elected vice president-air conditioning, heating and appliance sales at **Perfection Industries**, Cleveland, division of Hupp Corp. He was vice president-sales, Acme Industries, Jackson, Mich. **Donald G. Wright** was named general sales manager-contract sales. He was

Precision Bores and Faces Diffuser Cases

Another Special by Cross





This Two-Way Boring Machine roughs, semi-finishes and finishes the accessory drive shaft hole of Jet Engine Diffuser Cases at the rate of 2½ pieces per hour. The operator places the part in the work holding fixture and the rough boring cutters in the boring spindles, after which the rough boring is performed automatically. Next, the operator replaces the rough boring cutters with semi-finish boring cutters and the cycle is repeated for the semi-finish boring operation. Then, the finish boring operation is performed in a similar manner and the part is removed.

The cutters are supported in live precision bearing spindles, which are in turn supported by hardened and ground steel bushings adjacent to the work.

All cutters are pre-set for size and are quickly and easily changed for the different operations.

To provide maximum flexibility for future part design changes, the machine is built with Cross Modular "Building Block" Units.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN

M. C. PATTERSON
. . . president of Dodge Division

THOMAS J. RIGGS JR.
. . . Gabriel executive v.p. & g.m.

CHARLES R. C. STEERS
. . . Russell, Burdsall & Ward p.o.

general manager of Hupp Corp.'s Globe Stamping & Refrigeration Products Division.

M. C. Patterson was named president of **Dodge Division** of Chrysler Corp., Detroit. He succeeds **W. C. Newberg** who was assigned to the new post of group vice president-automotive.

Proctor Electric Co. elected Baltimore plant manager, **Harvey E. Hortman** a vice president.

Maurice I. Roth Jr. was appointed to the new position of sales manager-original equipment, liquid filters division of **Dollinger Corp.**, Rochester, N. Y.

C. P. Milne was named vice president and general manager of **Massey-Harris-Ferguson Inc.**, Racine, Wis. He was executive vice president.

Thomas J. Riggs Jr. was elected executive vice president and general manager of the **Gabriel Co.**, Cleveland. He was president of F. L. Jacobs Co., Detroit.

Roger C. Loew joined **Eldon Mfg. & Engineering Co. Inc.**, Milwaukee, as executive vice president and treasurer. He was a Milwaukee advertising executive.

Elwood N. Pearce Jr. was named purchasing agent of **Carolina Steel & Iron Co.**, Greensboro, N. C.

Eric A. Johnson Jr. was elected president of **Inland Wire Products Co.**, Chicago, succeeding his father who retired after 30 years with the company.

John L. Somerton was named to the new post of assistant treasurer, **Columbia Steel & Shafting Co.**, Pittsburgh. He was chief accountant.

Charles R. C. Steers was named purchasing agent, **Russell, Burdsall & Ward Bolt and Nut Co.**, Port Chester, N. Y. He succeeds **P. M. Culyer**, retired.

David W. Singley was appointed general superintendent, **Henry Disston Division**, Philadelphia, H. K. Porter Company Inc. He was superintendent of industrial manufacturing.

Joseph H. Skidmore was named vice president-production at **Virtue Bros. Mfg. Co.**, Los Angeles.

Lindberg Engineering Co., Chicago, named **Richard Schoenfeld** as administrative assistant. He was manager of Wheelco division of the Barber Colman Co., Rockford, Ill.

E. W. Bliss Co., Canton, O., appointed **James T. Harrington** secretary. He was assistant secretary and director of public relations.

OBITUARIES . . .

Henry B. Mitchell, 82, former chairman, **Griscom-Russell Co.**, New York, died July 30.

Gordon Janes, chairman, **Canadian SKF Co. Ltd.**, Toronto, Ont., died July 21.

J. Charles Lehner Jr., 41, general manager, **Toledo Steel Tube Co.**, Toledo, O., died July 25.

William J. Bartels, 63, vice president and treasurer, **Erie Malleable Iron Works**, Erie, Pa., died July 25.

W. M. Wood, 85, retired chairman and founder, **Mississippi Valley Structural Steel Co.**, Decatur, Ill., died July 28.

Alfred C. Layman, 84, president and founder, **A. C. Layman Machine Co.**, Wilmington, Del., died July 23.

Erle Gladstone Hill, former director of metallurgy and development, **Wheeling Steel Corp.**, Wheeling, W. Va., died July 26.

Theodore C. Wiedenhoefer, 62, manager-mine hoist division of **Nordberg Mfg. Co.**, Milwaukee, died July 24.

Ancil H. Bishop, 65, vice president, **U. S. Industries Inc.**, New York, died July 30.

Clarence T. (Cy) Burg, 62, vice president, **Iron Fireman Mfg. Co.**, Cleveland, died Aug. 1.

Now Kearney & Trecker has Front-Mounted *(convenience-engineered)* Handwheel

Available under Tool-Lease program

Standard equipment on new TF Series milling machines — front-mounted for faster table settings ... positioned to prevent errors

THE front-mounted table handwheel is a standard feature on all Kearney & Trecker new TF Series, knee-type milling machines — Plain, Universal and Vertical. Mounted on the right front of the saddle and projecting diagonally, the newly positioned handwheel is a part of Kearney & Trecker's up-front central control grouping.

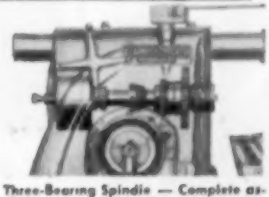
Because the handwheel is ideally located so as to simplify operation of the machine, the operator makes table settings more accurately — in less time and without leaving his normal operating position. It measurably reduces operator fatigue.

In addition, the new TF's give you a combination of more outstanding design and operating features (illustrated at left) than any other knee-type milling machine on the market today. They're available in five sizes — No. 2 to No. 6 from 10hp to 50hp.

For complete specifications, and what these TF's can do for you, see your nearest Kearney & Trecker representative, or write direct to Kearney & Trecker Corp.

5 more reasons why TF Series milling machines are so easy to operate

Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life, better finish and quieter operation.

Double "Vibra-Void" Overarms — Two solid steel bars, mounted completely through column, void vibration at source, afford more rigidity and resistance to deflection than any other type support. Design also greatly simplifies changing of arbors and cutters.

Twin Screw Knee Support — Exclusive double-support arrangement most effectively distributes weight of new machines' much wider, heavier knee, saddle and table. Balanced design increases stability under heaviest loads . . . offers greater resistance to torsional thrust under all cuts.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

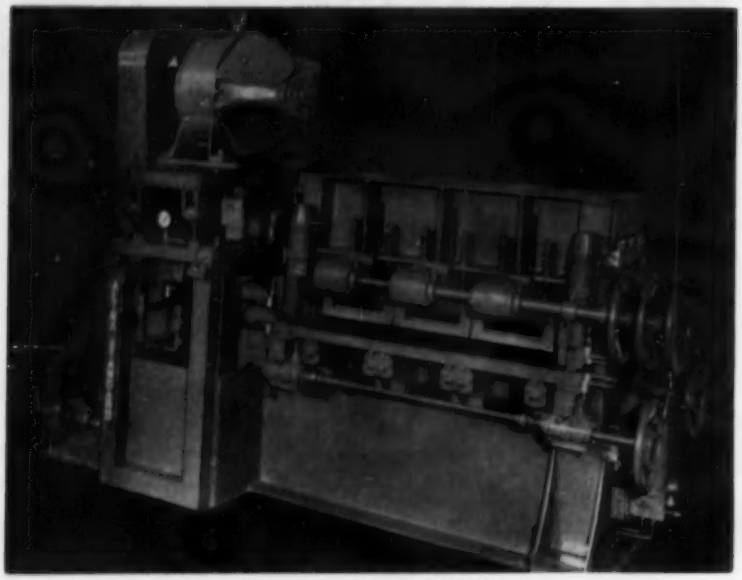
KEARNEY & TRECKER
MILWAUKEE

BUILDERS OF
PRECISION AND PRODUCTION MACHINE TOOLS SINCE 1898

KEARNEY & TRECKER CORP.
6790 W. National Avenue, Milwaukee 14, Wisconsin
Please send me Catalog No. TF-50 with details on new line of TF Series Plain, Universal and Vertical milling machines.

Name .....
Title .....
Company .....
Address .....
City ..... Zone ..... State .....

BEARING TIPS by McGill



138 GUIDEROL® BEARINGS BACK UP WORK ROLLS IN AETNA STANDARD LEVELER

High load capacity vital to back-up roll support

For processing 16 to 30 gauge steel sheets and coils, this Roller Leveler built by Aetna Standard Engineering Company requires dependable components to deliver a consistent maximum output at speeds up to 400 feet a minute.

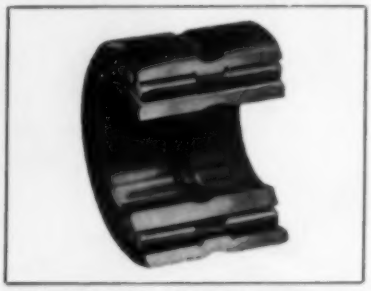
McGill GUIDEROL GR-16 bearings were selected for this machine and several larger versions use GR-24 and GR-36 bearings. They can carry the heavy irregular loads associated with flattening and leveling steel sheets and strips. Requiring less radial space, Guiderol bearings provide maximum roll neck diameters and offer greater strength at the necks of larger back-up rollers.

On the machine shown above, there is a total of 36 back-up rollers in 3 upper banks and 33 in 3 lower banks to resist the heavy pressure of the 48 inch working rolls. With a GUIDEROL bearing at each end of the 1¾" back-up rolls, a total of 138 bearings is required for the Leveler. These bearings have proved especially suited to supporting heavy loads longer in small radial space with reduced maintenance and production down time — important in steel mill operations.

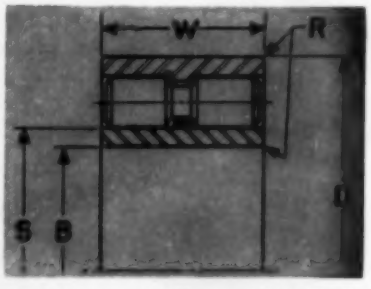
American Hoist Uses CT Series In Crane Blocks

Crane Blocks built by American Hoist and Derrick to withstand the greater strains and rough usage of lifts up to 500 tons rely on the greater capacity of GUIDEROL CT Series bearings in the sheaves. Interchangeable with retainer type cylindrical roller bearings, the CT Series full type roller construction has added capacity of over 38%. In sheaves these bearings offer greater angular stability with full race width rollers. Center guiding without retainer keeps these rollers aligned and prevents binding under eccentric loads.

Center-Guided Rollers Eliminate Load Wasting Cages



Guiderol Bearings inherently possess exceptionally high radial load capacity due to their full complement of small diameter rollers. Grooved rollers and a center guide rail keep rollers aligned as insurance against skewing and binding that is possible with ordinary needle bearings. Sizes interchange with needle and cylindrical roller bearings.



CT Series Adds Guided Roller Advantages to Cylindrical Roller and Ball Bearing Sizes

CT Series Guiderol Bearings provide the load carrying advantages of center guided rollers in cylindrical roller and ball bearing sizes. They are interchangeable in both single and double row dimensions. Inner rings are separable and may be eliminated to reduce radial space.

140 Pages of Bearing Facts

Write for your copy of Catalog No. 52, a revised 140-page Bearing Selection Guide. It contains vital product information and 30 pages of engineering data.

Insure performance with McGILL®

MULTIROL® GUIDEROL® CAMROL
Full Type Roller Bearings

McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA

Orders Billet Mill

Pittsburgh Steel's 6-stand, 30-in. continuous mill will be in operation late next year.

PITTSBURGH Steel Co. will install a $6-million billet mill at its Monessen, Pa., Works. Construction on the 6-stand, 30-in. continuous mill will begin in December. Full operation is scheduled for the latter part of next year.

The new mill, which will replace steam driven equipment more than 45 years old, is an addition to the $15-million, cost reduction program being completed at Monessen, says Avery C. Adams, president.

Erection of the mill, to be installed in existing buildings, will cause no appreciable interruption to production and will not require new financing.

Awards — Contracts have been awarded to: United Engineering & Foundry Co., Pittsburgh, mill machinery; General Electric Co., Schenectady, N. Y., main electrical drives; Westinghouse Electric Corp., Pittsburgh, auxiliary electrical equipment and switchgear. Giffels & Vallet Inc., Detroit, will do the detailed engineering.

With three vertical and three horizontal mill stands in a straight line, the new mill will be able to roll blooms from 9 x 10 in. down to 4-in. squares and 3⅝-in. rounds.

Excessive down time now required to change rolling sizes, which can amount to as much as 1 hour 15 minutes, will be reduced to as little as 2 minutes.

Foote Mineral Improves Plant

Foote Mineral Co., Philadelphia, is improving facilities at its Kings Mountain, N. C., plant. About $350,000 is earmarked for additional processing equipment; about $250,000 for enlarging office, laboratory and shop facilities.

Buys Canadian Plant

Gardner-Denver Co.'s Canadian subsidiary, Gardner-Denver Co. Canada Ltd., purchased the former Bickle-Seagrave plant in Woodstock, Ont. The company produces air compressors, rock drills, pumps and other air-operated equipment. Parent company's offices are in Quincy, Ill.

Plans Metal Refining Plant

P. R. Mallory & Co. Inc., Indianapolis, retained Lockwood Greene Engineers Inc., New York, for $500,000 to design a plant for the refining of rare metals.

Brooks & Perkins Opens Unit

Brooks & Perkins Inc., Detroit, opened a West Coast Engineering Division, 11655 Vanowen St., North Hollywood, Calif. The firm makes magnesium assemblies and has developed methods for hot drawing to extreme depths such metals as titanium and zirconium in a single operation. D. L. Erickson is manager of the division.

Acquires Boring Machine Line

Jones & Lamson Machine Co., Springfield, Vt., acquired manufacturing and selling rights to a small precision boring machine. Developed by Mecanair Inc., Sudbury, Mass., it is designed primarily for small production lots. The machine will be a product of Jones & Lamson's Thread Tool Division.

Fairfield Enlarges Gear Plant

Fairfield Mfg. Co. is expanding its gear manufacturing plant in Lafayette, Ind. Some 33 per cent more floor space will be available for machine installations. About a 100 per cent increase is being made in the heat treating area in which additional equipment is being installed.

Will Build Uranium Mill

Dawn Mining Co., 300 Park Ave., New York, will construct a $3-million uranium processing mill at Ford, Wash., about 20 miles north of Spokane. It will have a daily capacity of 400 tons. The firm operates a mine on the Spokane Indian reservation and has leased additional tracts on the reservation. The government will purchase the mill's uranium concentrate output. As with similar contracts with the Atomic Energy Commission, the mill will buy and process ore of other mining com-

Why use grit that has a "glass chin"?

STEELETTS

OUTWEAR CHILLED IRON GRIT 4 TO 1

Exhaustive tests in the cleaning department of Commercial Steel Treating Corporation have proved Steeletts cut grit consumption as much as 73.8% compared to chilled iron. One of the largest job heat treat establishments in the nation, this Detroit firm tested both types of grit in the same machine, cleaning the tough scale that results from heat treating.

BETTER FINISH, TOO

Steeletts also imparted a smoother, more uniform finish — and finish is very important to their customers. For more information on advantages and savings you can expect with Steeletts, write now for Bulletin 901-D.

WHEELABRATOR CORPORATION

509 South Byrkit Street
Mishawaka, Indiana

Finding the ROTTEN APPLE *in the* BARREL

William O Dunn

CHIEF INSPECTOR, THE CINCINNATI GEAR CO.

Several years ago we ran an ad entitled "Ears for Gears" that produced a lot of comment. The unusual title was explained in the copy, in which we told how we can individually *sound check* gears for minimum noise level. This checking is done on ultra-modern testing equipment, under specified load and R.P.M., measuring the decibel tolerances of the individual gears. Not only does this help us produce silent-running gears, but it is also one example of the extensive checking and testing to which we subject our gears, to be *sure* of maintaining our reputation for delivering only *good* gears.

This checking and testing, which is the responsibility of my department, is one of the most important functions in our plant. It's always *possible* for a "rotten apple" to slip into the barrel, but it's *essential* that it be found and removed before shipping. That's why my department can't afford to make any mistakes, or compromise in any way. Top management realizes this; they provide us with the best available equipment, and I report directly to our President (eliminating any possibility of "shop influences" in our testing standards). As a result, our customers have the assurance that when they send us an order they'll receive only the best custom gears obtainable.

THE CINCINNATI GEAR CO.
CINCINNATI 27, OHIO
"Gears—Good Gears Only"

CINTI

panies. The mill at Ford will be in operation by July 1, 1957. Robert B. Fulton of Newmont Mining Corp., owner of 51 per cent of the Dawn firm, will be resident manager of the plant.

Rockwell To Build Valve Plant

Rockwell Mfg. Co., Pittsburgh, will open a 180,000-sq-ft valve manufacturing plant at Kearney, Nebr. It will be completed by mid-summer of 1957 and will cost about $2 million.

York-Gillespie Lifts Capacity

York-Gillespie Mfg. Co., designer and builder of auxiliary steel plant equipment, material handling equipment and special machinery, completed a major renovation program at its Pittsburgh plant, quadrupling its productive capacity.

Plans Transformer Plant

Westinghouse Electric Corp., Pittsburgh, will build a multimillion dollar distribution transformer plant at Athens, Ga. The plant will be part of the firm's Transformer Division which has headquarters at Sharon, Pa. Gordon C. Hurlbert has been named manager of the plant. Production is scheduled to begin in mid-1958.

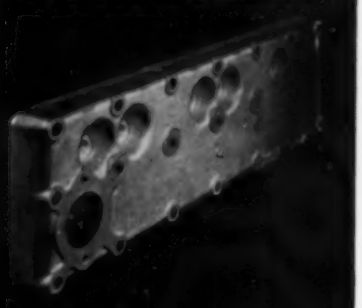
Electrocoating Firm Expands

Ransburg Electro-Coating Corp., Indianapolis, plans a $1-million expansion program. A building will be erected at 4000 W. 56th St., that city, to house offices, engineering and test laboratories and manufacturing facilities.

Porcelain Enamel Finish

Fischer & Porter Co., Hatboro, Pa., maker of process instrumentation, awarded a contract to Kaiser Metal Products Inc., Bristol, Pa., to supply "curtain wall" panels for its 91,000-sq-ft office building. The steel "sandwich" panels will be finished on the exterior face with porcelain enamel. Kaiser will supply matching steel sheet panels for a veneer on Fischer & Porter's present office and factory building.

BORES MOTOR BLOCKS 22% FASTER—
AND WITH 28% LESS TOOL WEAR



...thanks to
FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 54, Niagara Falls, N.Y.

CARBORUNDUM®

there's so much to choose from at Hotel Cleveland!

What's your pleasure? Fabulous roast beef in Cleveland's first specialty restaurant The Rib Room. Dancing to a famous orchestra in the smart Bronze Room. Relaxing over a drink in the stag Men's Bar. You'll find something to suit every taste and mood at Hotel Cleveland.

And you're in the very heart of town, close to business, shopping and theaters... directly connected with Union Passenger Terminal.

Industrial Artistry at GE

Miss E. C. Kasle is admiring the handiwork of a stamping machine that automatically produces these symmetrical stacks of metallic plates at General Electric's rectifier department at Lynn, Mass. These plates will be processed into rectifier cells destined for electronic applications

---

Bell Enters Automation Field

Bell Aircraft Corp., Buffalo, established a subsidiary, Bell Automation Corp., to develop and manufacture automation devices. It has leased a plant at 749 Monroe St., Rochester, N. Y.

A. Milne Opens Branch

A. Milne & Co., New York, distributor specializing in tool steels, opened a sales office in Phoenix, Ariz. Robert F. Frazure is manager in charge.

Ford Expands Atlanta Plant

Ford Motor Co.'s Ford Division, Dearborn, Mich., will add 407,000 sq ft of manufacturing floor space to the present 653,000 sq ft at its assembly plant in Atlanta.

Square D To Build in Kentucky

Square D Co., Detroit, will build a $3-million electrical equipment plant at Lexington, Ky. About $1 million will be spent for equipping the 150,000-sq-ft facility. The plant is scheduled for completion in one year. Pilot operations are being conducted in leased space

Abrasive Cutting | *the best way to cut many materials*
the only way to cut some

Campbell Cut-Off Machines

WHAT KIND OF A CUT DOES YOUR JOB REQUIRE?

THIS Clean, smooth edges that require no further finishing
or THIS Rough, serrated edges that must be machined if smooth finish is required

• The smooth cut—made on a CAMPBELL Oscillating Wet Abrasive Cut-Off Machine and the just-right ALLISON Abrasive Wheel for the job—saves a grinding operation at a Midwest gear plant.

Another combination of CAMPBELL Cut-Off Machine and ALLISON Wheel cuts stainless steel tube twice as fast as by other methods for a large aircraft manufacturer.

Can you cut tough K Monel, 4¼" dia., in two minutes per cut by present methods? Whatever your problem, our abrasive cutting specialists can improve your cutting operation and save you money.

OSCILLATION makes these big cuts with speed and economy

• The cross section of gear teeth (*shown left above*) is cut smooth, fine-finished and ready for metallurgical study.

It results from the wet cut of an Oscillating CAMPBELL Abrasive Cut-Off Machine with abundant coolant applied just where it does the most good. The Oscillation of the ALLISON Abrasive Wheel, the right one for the job, handles big cuts like this with speed and economy.

If your cutting involves alloy or high carbon steel, this CAMPBELL-ALLISON combination just can't be beat.

Let us send you this book

ACCO

Campbell Machine Division
AMERICAN CHAIN & CABLE

925 Connecticut Avenue • Bridgeport 2, Connecticut

Flexible,
fast and safe,
Coles mobile cranes
can do more jobs
better
for less

Coles works closer to stacks for accurate spotting. Maximum SELECTIVITY

COLES
CRANES
JOLIET 7, ILLINOIS
Write for booklet "101 COST-CUTTING WAYS"

Photo courtesy of International Harvester Company's Tractor Works, Chicago, Illinois

Now, available L.P.G.- diesel- or gasoline-electric powered in capacities from 2 to 15 tons. Available on long term lease arrangement, too.

for the assembly of panelboards and switchboards.

Harbison-Walker To Expand

Harbison - Walker Refractories Co., Pittsburgh, will build a 150,000-sq-ft plant in Hammond, Ind., and will add 22,000 sq ft to its plant in Baltimore and 7200 sq ft to its plant in Leslie, Md. Luria Engineering Co., Bethlehem, Pa., was awarded contracts for these projects. The Hammond factory will be the first in the Chicago district devoted to the production of basic refractories.

Bryant Building Warehouse

Carrier Corp.'s Bryant Division is erecting a $700,000 warehouse at 1100 W. 21st St., Indianapolis 4, Ind. Bryant makes heating and cooling equipment.

Tube Reducing Opens Branch

Tube Reducing Corp., Wallington, N. J., opened a branch office at 10336 S. Western Ave., Chicago. D. L. Watson is the district manager.

Bekaert Forms Subsidiary

Bekaert Steel Wire Corp. has been organized as a New York corporation and a subsidiary of Trefileries Leon Bekaert, Swevegem, Belgium, wire manufacturer. Alex J. van Goylen is president of the new firm with offices at 655 Madison Ave., New York 21, N. Y.

Austenal Changes Name

Austenal Laboratories Inc., New York, changed its name to Austenal Inc. The firm is a leader in the investment casting field. It is an important supplier of buckets, vanes, blades and other components for jet engines and precision parts for industry.

To Build Chemical Fuel Plants

Olin Mathieson Corp., Baltimore, will build a $36-million plant at Lake Ontario Ordnance Works, Model City, N. Y. It will produce a new high-energy chemical fuel for missile and aircraft engines under a contract with the Air

The gears in an automatic nut former have to be tough and strong to withstand heavy, varying loads. Yet, the castings from which they're made should be easy to machine. That's why this gear for a Waterbury Farrel Automatic Nut Former is made from ASTM-50 gray iron with a nominal composition of 1% nickel and .50% molybdenum.

Moly gives cast iron gears higher strength with toughness and good machinability

"To insure a tough, easily machined gray iron for the gears in our Automatic Nut Formers," says Henry C. Griggs, Metallurgist for Waterbury Farrel Foundry & Machine Co., "we specify .50% molybdenum in our ASTM-50 material. The properties of this material contribute importantly to the reputation of Waterbury equipment for accuracy and high speed production under severe operating conditions."

Molybdenum helps to give reliable and reproducible castings – very important factors in consistent performance of gears.

Investigate moly irons. They may be the key to better performance in many of your gear applications.

For the first two in a series of bulletins, "Why Moly Iron," or for technical assistance, write Climax Molybdenum Co., Department 3, New York 36, N. Y.

CLIMAX MOLYBDENUM

HEAT TREATING FURNACES for INDUSTRY

HEVI DUTY

HEVI DUTY BOX TYPE FURNACE

Hardening piston rings at 1850° F. is one exacting use of this furnace. Hevi Duty design and construction assures uniform and fast heating with low maintenance costs in electric furnaces for many applications.

HEVI DUTY SALT OR LEAD BATH POT FURNACE

Salt bath hardening, tempering, and cyaniding without scale are major applications of the Hevi Duty Electric Pot Furnace. A case of .004 to .005 is obtained in 15 to 20 minutes on parts immersed in cyanide salt at 1550° F.

HEVI DUTY SHAKER HEARTH FURNACE

This modern production tool will either carburize, nitride, dry cyanide, or bright harden up to 150 pounds of work per hour. The work passes through the furnace and drops directly into the oil quench. Results are clean, uniformly treated parts with minimum distortion. Bulletin HD-850.

Hevi Duty Electric Company designs, and builds many types of electric heat treating furnaces and gas generators. Call on us to help solve your heat treating problems.

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

Force. A smaller plant will be built for the Navy at the same place.

Foundry Opens Sales Office

Patterson Foundry & Machine Co., East Liverpool, O., established a sales office in Cleveland. R. E. Witherow is district sales manager

Coupling Firm Expands Plant

Ajax Flexible Coupling Co. Inc., Westfield, N. Y., is enlarging its plant. Productive capacity will be doubled. The firm's products include couplings, screens, packers and reciprocating drives. Additional machinery will be delivered in November.

Marchant Calculators Builds

Marchant Calculators Inc., Oakland, Calif., is erecting a $4-million main factory and headquarters building. Scheduled for completion in July, 1957, it will contain 500,000 sq ft of floor space.

NEW ADDRESSES

Industrial Retaining Ring Co., moved from Mt. Vernon, N. Y., to enlarged quarters at 57 Cordier St., Irvington, N. J.

Vanadium Corp. of America, New York, moved its engineering department from Niagara Falls, N. Y., to its new research center at Cambridge, O. H. C. Parkman, assistant vice president, has been temporarily assigned to a new post as assistant vice president in charge of engineering. Other appointments are: R. A. Davidson, chief plant engineer; Floyd G. Fellows, power engineer; James R. Lee, design engineer; and Delmon H. Tammen, chief field engineer.

Pheoll Mfg. Co.'s Aviation Division moved to 4641 Leahy St., Culver City, Calif.

Lane-Wells Co., Los Angeles, one of the Dresser Industries, moved its advertising and sales management headquarters to 511 W. Alabama, Houston 6, Tex. Houston offices are headed by James D.

PULLMAN-STANDARD FINDS MANY USES FOR STEELWELD PRESS

Model L5½-10 Steelweld Press making hutch frame parts for phosphate cars. Two parts are made at one time from ¼ inch plate; one for left-hand and other for right-hand of hutch. Note pins on male dies which remove parts from lower dies after forming.

A few of the many parts produced within a short period on the Steelweld Press. Curves and bends of every shape and degree are formed quickly and accurately.

"The more we use our Steelweld Bending Press, the more we learn about what it can do for us", said the Day Superintendent of Pullman-Standard Car Mfg. Co., Butler, Penna. "As a result it is handling more and more of our work. We are doing a great many forming jobs on it that did not occur to us as being possible when we first installed the machine."

An endless variety of parts are produced on this press. These are mostly of ¼ and ⅜ inch steel plate and involve curves and bends of every description for gussets, fulcrums, braces, frames, housings, etc. used in the manufacture of railroad cars.

The dies used are relatively simple and made in the company's shop. Because dies are easily changed, it usually takes about an hour to set up for a new job.

If you work with metal plate in any thickness up to one inch, for bending, forming or punching, you should get the facts on the many features of Steelweld Presses.

GET THIS BOOK!

CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7830 East 281st Street, Wickliffe, Ohio

STEELWELD

BENDING PRESSES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

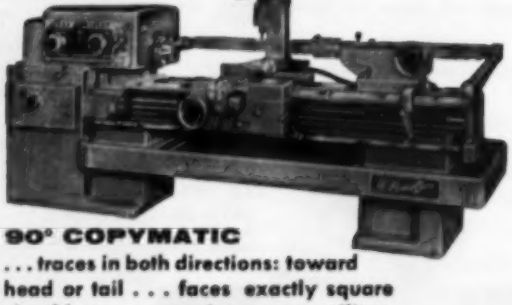
45° OR 90° *Powerturn* COPYMATICS

LODGE & SHIPLEY TRACER CONTROLLED LATHES

Lodge & Shipley produces both these versatile duplicating lathes! Now, choose the type that perfectly suits your production. Speaking of production, these new lathes really produce at low cost. They combine proven advantages of all-hydraulic duplication . . . featuring either 45° or 90° tracing slide . . . with all the new POWERTURN features.

There are 5 new sizes and types of COPYMATICS suitable for your needs. Complete details are available in two new pieces of literature: Bulletin 309, 90° COPYMATIC and Bulletin 310, 45° COPYMATIC. For your copies, address: The Lodge & Shipley Company, 3055 Colerain Ave., Cincinnati 25, Ohio.

45° COPYMATIC
. . . offers contour facing as well as turning and boring . . . particularly suited for turning contours involving diameters connected to faces by curves!



90° COPYMATIC
. . . traces in both directions: toward head or tail . . . faces exactly square shoulders . . . maximum versatility and tracing capacity!

more than ever before . . .
your LODGE-*ical choice is* **Lodge & Shipley**

3070 Colerain Ave., Cincinnati 25, Ohio

Hughes, vice president, sales and service.

Colorado Fuel & Iron Corp. moved its Philadelphia district warehouse and sales office to 225 W. Erie Ave., that city.

Wedgeplug Valve Co. Inc. moved its entire operation to 4000 Tenth Ave. N., Birmingham 2, Ala.

Allmetal Screw Products Co. Inc. moved its **West Coast Division** to 2978 Wilshire Blvd., Los Angeles 5, Calif.

The district sales group of the **Parts Division, Sylvania Electric Products Inc.**, New York, moved to 1000 Huyler St., Teterboro, N. J.

CONSOLIDATIONS

Allegheny Ludlum Steel Corp., Pittsburgh, purchased **Paul R. Repath Inc.**, Los Angeles, producer of electrical steel laminations, metal stampings and deep-drawn transformer cans. Allegheny Ludlum's subsidiary, Arnold Engineering Co., Marengo, Ill., will operate this property as the Repath Pacific Division.

Darling Valve & Mfg. Co., Williamsport, Pa., purchased **Philip Gies Foundry Ltd.**, Kitchener, Ont., including its subsidiary, Canada Valve & Hydrant Co. Ltd., Brantford, Ont.

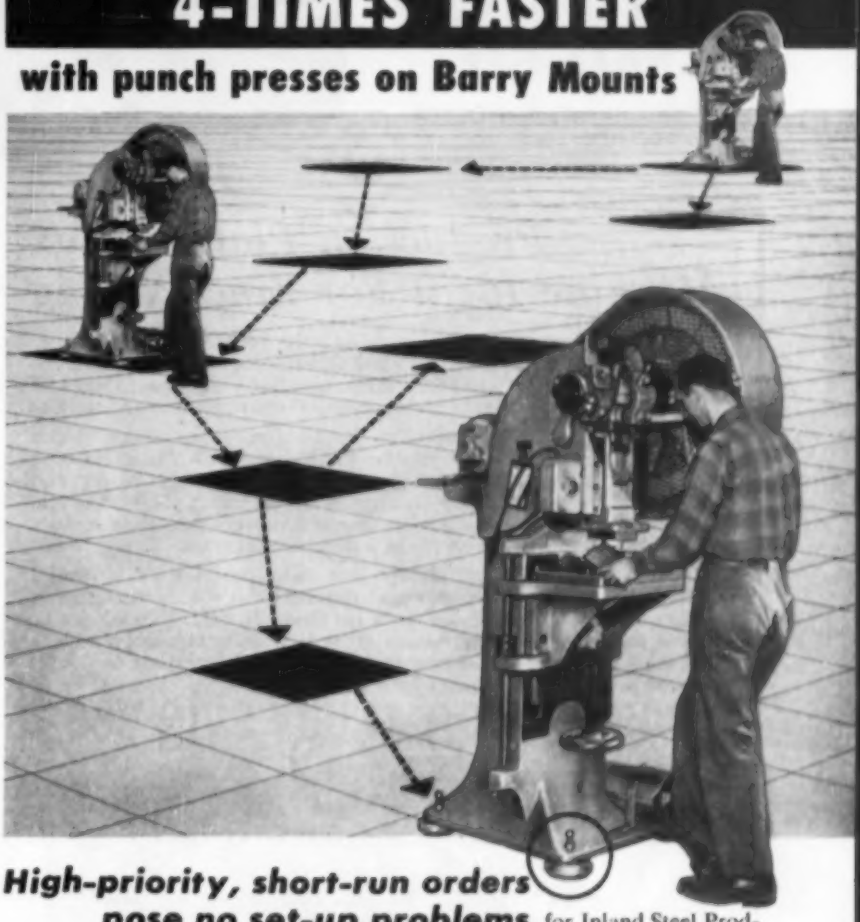
Shenango Furnace Co., Pittsburgh, consolidated its subsidiary, **Shenango-Penn Mold Co.**, into the parent organization. Shenango-Penn foundry operations at Sharpsville and Neville Island, Pa., and centrifugal casting operations at Dover, O., become divisions of the parent company.

Michigan Chrome & Chemical Co., Detroit, acquired **Pyramid Plastics Co.**, Chicago, which will continue operations under the same name.

Federal-Mogul-Bower Bearings Inc., Detroit, and **National Motor Bearing Co. Inc.**, Redwood City, Calif., merged. National will be operated as the National Seal Di-

INLAND STEEL PRODUCTS moves into special production 4-TIMES FASTER

with punch presses on Barry Mounts



High-priority, short-run orders pose no set-up problems for Inland Steel Products Company, of Milwaukee. In ½-hour or less, punch presses equipped with Barry Machinery Mounts are moved right where they are needed —often to an entirely different department—and are in full production.

Efficient organization of production lines, plus mobilization with Barry Mounts, enables this famous fabricator of sheet-metal building products to handle special orders profitably—even for runs of only a few hours. And savings, in installation cost alone, have already totaled over $300 per machine.

Barry Mounts Can Boost YOUR Profits, too.

Barry Survey Chart SB-756 shows how you can

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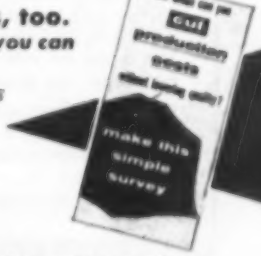
- *reduce down-time during tool changes*
- *eliminate "in-line" maintenance*
- *avoid need for machine duplication*
- *gain higher operating speeds*
- *stop building-borne vibration*
- *cut down noise*
- *decrease rejects from precision tools*

Ask for FREE check chart



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THE FINISHING TOUCH

"LITTLE STEVE" PAYS OFF

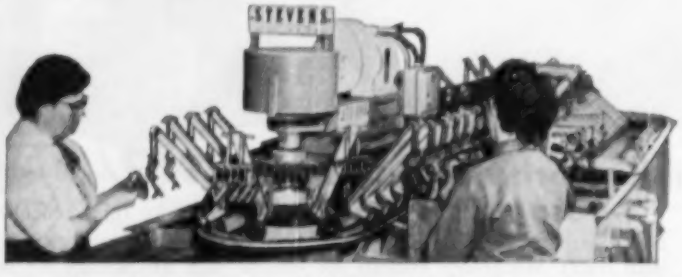
by A. B. HOEFER
vice president
FREDERIC B. STEVENS, INC.

Production Plater Finds Machine Ideal For Zinc Plating

There's a feeling of satisfaction among the people in our company when a Stevens machine is installed and does a better job than the customer anticipated. That feeling reaches all the way from President through engineers, salesmen and typists who write up the specifications.

We are particularly proud of an installation of one of our "Little Steve" machines made recently for the Miller-Smith Manufacturing Company, Spring Lake, Michigan. The partners, John Miller and George Smith, are operating an aggressive business in job buffing and plating, and after receiving some of our literature including a story on the "Little Steve," soon made a purchase from us.

The "Little Steve" fit ideally into their program. The capital outlay met their requirements and the machine is daily turning out a big quantity of zinc plated parts for them. In fact, 105,000 can be plated each working day, which right now is an around-the-clock operation. Just as soon as new racks are built they expect to double present production on some of the parts.



The Miller-Smith management tell us that they are operating much more efficiently now than they did previously with a competitive machine. Parts are being zinc plated to a .0002 thickness every three minutes. They are saving on valuable floor space too, for the "Little Steve" occupies only 162 square feet as compared to 441 square feet used by their previous equipment.

When we asked for comments about the "Little Steve" from Messrs. Miller and Smith, they said: "We are well pleased with the machine —in fact, we're proud of it. We'll be glad to recommend it to anyone." While we are not unused to such comments on our various machines, each new one gives us a warm glow of satisfaction.

This efficient machine fits easily into existing factory layouts because of its size. Only seven feet wide and ten or more feet in length, it can be placed on a factory floor without moving existing machinery.

For further information write to Frederic B. Stevens, Inc., Detroit 16, Michigan.

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METAL FINISHING EQUIPMENT AND SUPPLIES FROM CASTINGS OR STAMPINGS TO FINISHED PRODUCT

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vision of Federal-Mogul-Bower. Milton Bulkeley, former executive vice president and treasurer, becomes general manager of the division.

I-T-E Circuit Breaker Co., Philadelphia, acquired **Kelman Electric & Mfg. Co.**, Los Angeles.

Addressograph - Multigraph Corp., Cleveland, acquired **Ralph C. Coxhead Corp.**, Newark, N. J., maker of office type-composing machines.

Alter Co. purchased all the physical assets of **Davenport Besler Corp.** Both are in Davenport, Iowa. This is the initial phase of a $3-million expansion program launched by Alter, maker of secondary nickel alloys. The firm is installing additional electric furnace facilities, boosting its capacity by 400 per cent.

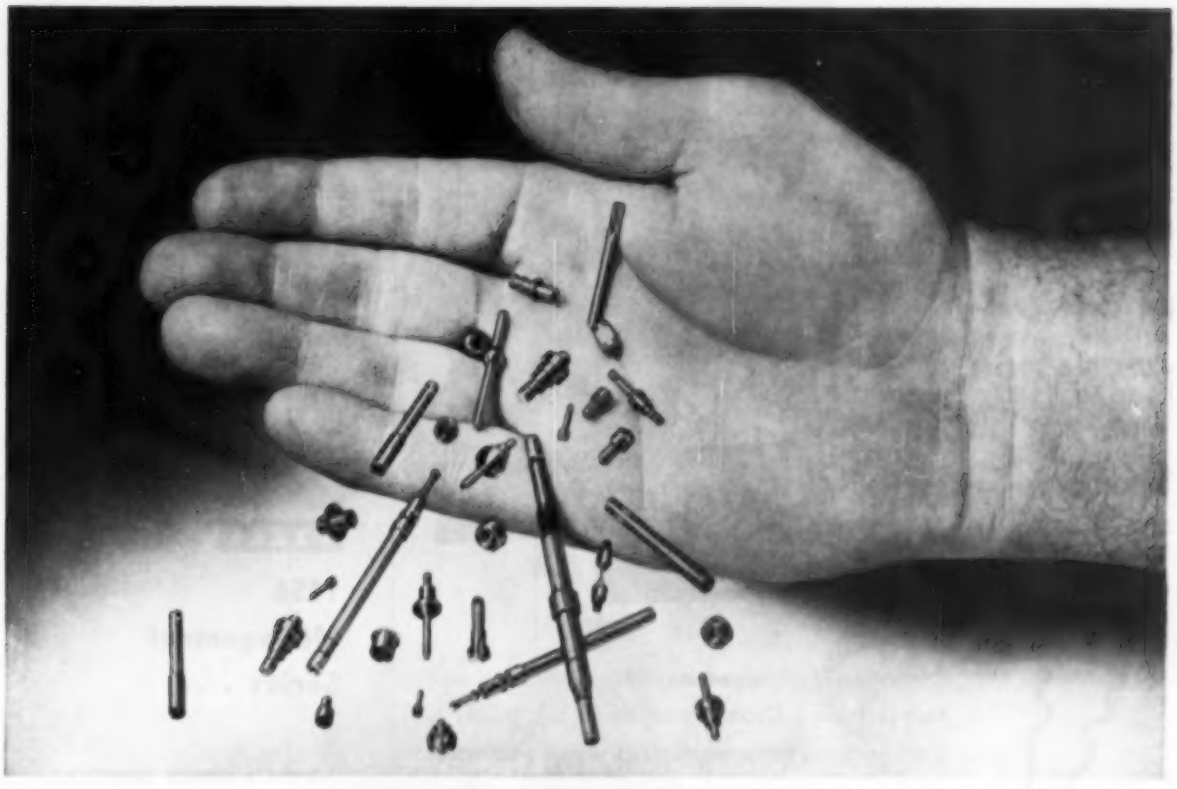
Franklin Balmar Corp., a wholly owned subsidiary of **Franklin Railway Supply Co.**, was merged with the parent company. The name Franklin Balmar Corp. was adopted by the surviving corporation. Administrative offices are at 60 E. 42nd St., New York; business offices and plant, Woodberry, Baltimore.

Subject to approval by stockholders, **White Sewing Machine Corp.** and **Apex Electrical Mfg. Co.**, both of Cleveland, will merge.

E. W. Bliss Co., Canton, O., acquired **John Robertson Co. Inc.**, Brooklyn, N. Y., and will operate it as a subsidiary. The Robertson firm makes lead extrusion presses and related equipment.

ANNIVERSARIES

General Motors Corp.'s New Departure Division, Bristol, Conn., will observe its golden anniversary as a manufacturer of precision ball bearings during the week of Sept. 9. The division's plants are in Bristol, Meriden, Conn., and Sandusky, O. Besides bearings, the division makes bicycle coaster brakes and front wheel hubs, steel balls and automatic transmission parts.



Do small parts like these give you large problems?

Anaconda Rod solved costly production problems for G & F Manufacturing Company, Philadelphia

The trend toward miniatures has led to a tremendous increase in the use of small precision parts like these. And this has placed a heavier burden on the screw machine operator and the buyer of rod. Uniformity of alloy and dimension in batch after batch of screw machine rod is vital for economical production.

ONE COMPANY'S PROBLEM: The G & F Manufacturing Company of Philadelphia specializes in automatic screw machine production of minute parts, finished to precise dimensions. This company was experiencing costly production delays with the rod they were using, due to jamming and freezing of the rod as it was fed into the machines.

THE SOLUTION: Then G & F tried Anaconda Free Cutting Brass-271 Rod in the diameters required for their type of small-part production. They found it highly satisfactory. Down time, due to jamming or freezing of the rods, has been practically eliminated and production schedules are completed without costly interruption.

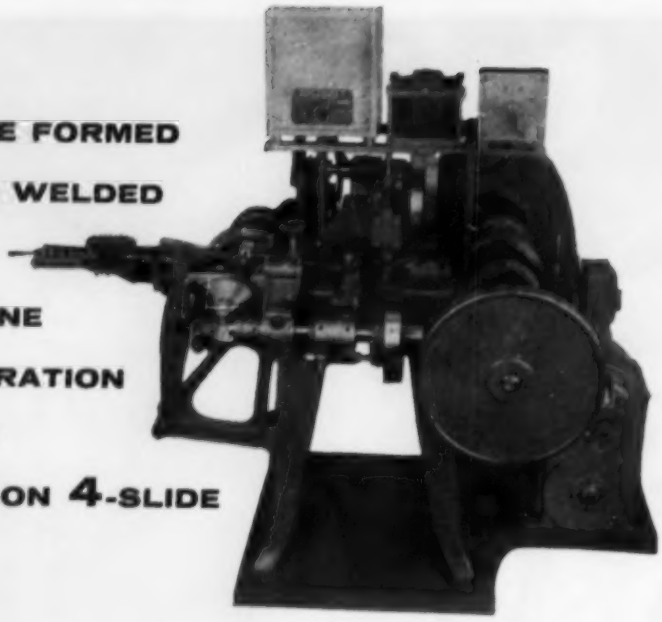
Whether for small parts of extreme accuracy—or for ordinary screw machine production—The American Brass Company can furnish free-cutting copper and copper-alloy rods fabricated to meet the requirements of the operation—uniform in length, diameter, temper and composition.

FREE TECHNICAL SERVICE: It is the function of the Technical Department of The American Brass Company to assist metal users in the solution of special problems. This service is at your disposal without charge or obligation.

Comprehensive data on composition and machinability of standard Anaconda Alloys, standard specifications, weights and dimensions of standard rods is available in Publication B-3. For this booklet—for special technical assistance—write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA® RODS FOR SCREW MACHINE PRODUCTS

WIRE FORMED AND WELDED IN ONE OPERATION WITH NILSON 4-SLIDE



Garter loop formed and welded in one fast operation by Nilson 4-Slide.

Production is increased more than 25% by Hawie Manufacturing Company using a #1 Nilson 4-Slide with welding attachment which eliminates need for ferrule loops in the manufacture of hose supporters. .062 soft basic wire is formed with ends welded in one automatic operation at a conservative 105 pieces per minute. Additional savings are realized in eliminating cost of ferrule.

Another example — Drapery hook is formed with two wires entering 4-Slide simultaneously and automatically welded together at point of contact.

Nilson 4-Slides will produce many types of wire forms similar to the part shown here in which two pieces must be welded or otherwise closed together. By the mounting of automatic welding equipment on the 4-Slide, such parts can be produced in one fast, accurate operation at minimum cost. Nilson 4-Slide Wire Forming Machines are available in a wide range of sizes to handle basic steel wire from 1/32" to 1/2" diameter.

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Automatic Chain Making Machines • Staple Forming Machines • Wire and Stock Reels • Wire Straightening Equipment • Slide Feeds for Presses • Wire and Ribbon Stock Forming Machines

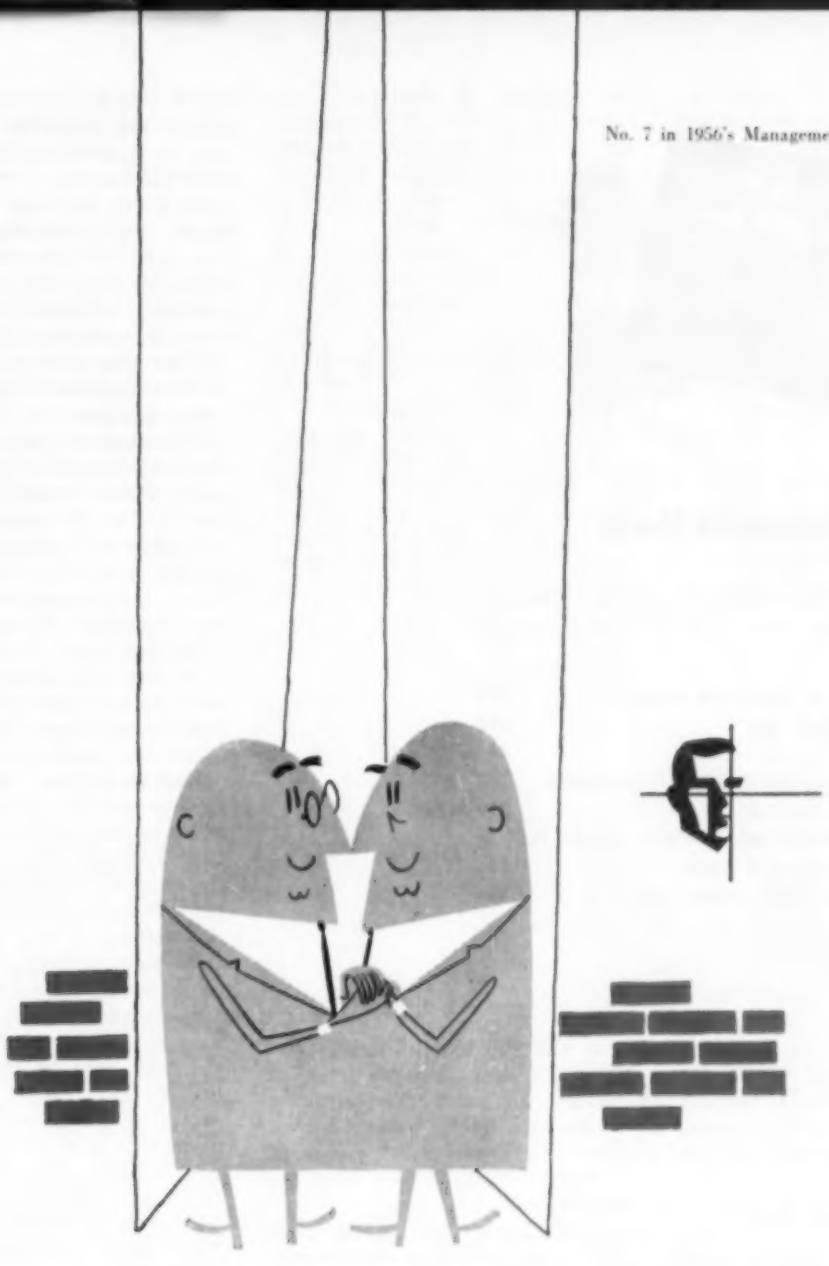
7

STEEL's 1956 Management Series . . .

STEEL's editors herewith present the seventh in their ten-part series, Program for Management for 1956. The complete list:

1. **It's Time To Grow** (Feb. 13, p. 81)
2. **Know Your Costs** (Mar. 19, p. 83)
3. **Ideas for Industry** (Apr. 23, p. 105)
4. **Metalworking Goes to Market** (May 14, p. 107)
5. **Metalworking's New Horizons** (June 18, p. 137)
6. **How to Live with SUB (Supplemental Unemployment Benefits)** (July 16, p. 121)
7. **To Merge or Not To Merge** (Aug. 13, p. 89)
8. **Motivating Men To Produce** (Sept. 24)
9. **Automation—Bogeyman or Bonanza?** (Oct. 15)
10. **Industry and College—Partners in Development** (Nov. 12)

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



To Merge or Not To Merge

TO MERGE or not to merge? That is one of the top questions among growth-minded industrial executives today.

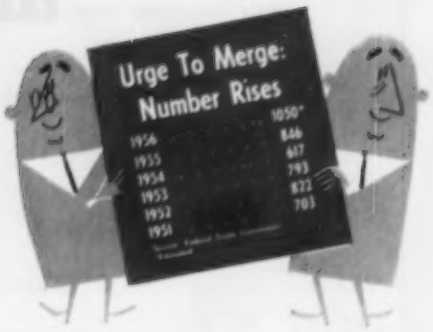
Some people shy away because the word has picked up an unsavory connotation. This article considers the subject positively. Its thesis is that the merger can offer substantial benefits, such as sudden growth, diversification and possible tax advantages.

Whether you are on the buying or selling side of a merger transaction, here is the kind of know-how you will need to make a sound investment.

Some knotty problems (personnel for one) and other matters of common import to the buyer and seller are discussed first. Specialized information on how to buy a business and how to sell your business follows.

To give you an idea of how vital such information is today, listen to Rodney C. Gott, executive vice president, American Machine & Foundry Co., New York:

"Few companies can fail to have



Why Companies Merge

A Federal Trade Commission study of 2091* mergers and acquisitions names these as the principal benefits to the acquiring firm:

Larger capacity to supply old markets	**804**
Lengthened product line	**497**
Diversification	**448**
Facilities to supply goods formerly purchased	**252**
Access to a new market	**210**
Facilities to process or distribute goods for which it once acted as agent	**168**
Other (an empty plant, patents, etc.)	**161**

*Some transactions result in more than one chief gain, so column totals more than 2091

been involved in one or more mergers, whether on the acquiring or the acquired side—or, at the least, to have contemplated the possibility of this kind of sudden growth."

First Things First

The success you experience with mergers will depend a great deal on how well you know your own business. Here is a suggested procedure:

1. Set up a target. What do you want to be, say, ten years from now? (Many companies use that timing.) Even a poor target is better than none.

2. Evaluate your assets and abilities: Management, products, research and development, plants, growth trends, financial resources.

3. Do you want to stay in your own field? Or do you want diversification of products or markets?

4. Determine what expansions can best be done internally.

5. Figure out what expansion will have to be done externally.

6. Can you best hit your target by using your own resources, by buying out other companies, by selling out or by some combination of the three?

7. Periodically review what you want to be.

Bull's-Eye—"Only if the plans for future growth of the company are well established will you have sound acquisitions," advises Blaw-Knox Co., Pittsburgh. "They allow you to concentrate in a field in which you have faith. They allow quick elimination of offers which have no relation to your needs."

Admittedly, there is plenty of room for error even with the best of planning. Even companies with experience admit they sometimes get a lemon. But careful planning is good insurance.

Step No. 2: Execution

Most companies assign responsibility for a merger program to one office or offices. Some even set up a separate department. In others, the executive vice president or the financial vice president often has the job.

At Elgin National Watch Co., Elgin, Ill., a department reports directly to the president for quick communications and for prestige reasons. It is charged with a search program, screening leads, preparing for negotiations, presenting recommendations to management.

The Market—"Once it's known you're interested in acquisitions or mergers, companies come to you," states James Cassell of U. S. Industries Inc. To spread the word, you might try holding a press conference like Elgin did. Or you might try some of the sources that are listed on page 95.

Another tactic that gets results is to plug your plans (unless you want to sell) wherever you can. Possible outlets are your press releases and stockholders' meetings.

Beat the Drums—Publicity is the key to getting a wide selection of leads. Gordon Odell, manager of Elgin's Commercial Development Department, points out that each time Elgin announced an acquisition a flurry of new leads came in.

Business brokers sometimes can come up with a good deal. If you're approached by a broker, check him with your bank and check the company he says is for sale. Most brokers are reliable, but play it safely—a shady few will try to promote a sale when it definitely isn't suitable. Few companies like to let a third party negotiate for them; they'd rather put negotiations on a management-management basis.

Human Relations

"One thing you get from a merger that doesn't appear on the balance sheet is personnel," observes D. H. Gearhart, president, Hupp Corp., Detroit.

Yet personnel can be one of the big problems of a merger or acquisition. People will be jittery about what is going to happen to them. If the buyer is a reputable firm, the fears have little basis.

Common Sense—"As we look at a company in today's market, we're buying ability, and we strive to hang on to it—in fact, it may be a deciding factor in whether the

deal goes through," states Frank F. Elliott, president, Crane Co., Chicago.

"To the best of my knowledge, we've had no personnel loss as a direct result of mergers in ten years," comments Herbert S. Ide Jr., treasurer and assistant secretary, Eaton Mfg. Co., Cleveland.

Tactics—Key people seem more likely to leave when a merger is in the grapevine stage. About all you can do is work with the management people in the company you're acquiring. Try to get them to use their influence to retain personnel.

A chief engineer wanted to leave after his firm was bought out. The acquiring company gave him a three-month leave to think it over. He came back.

Some use employment contracts, though one executive points out that they have limitations. They don't overcome personal obstacles, even though they are morale boosters.

Case History—Most firms advise a temporary hands-off policy. An executive for a machinery maker cites a case where speculation about the company's sale was rapidly developing into a serious morale problem. "Hourly rated personnel," he says, "were even more jittery than management. The morale factor was one of the reasons why we at first operated that acquisition as a subsidiary rather than a division.

"We tried to make ourselves scarce so as not to be an upsetting influence. Had the acquisition been made a division, it would be normal to offer all staff services. Gradually, we're coming into the picture. What we've had to do is a low pressure sales job. It's working and will work even better as we get better acquainted.

"Their benefit program was completely different from what we had. We offered them our complete package, plus a choice of our pension plan or theirs. Gradually, we'll try to have only one, as good or better than the original, but on a basis that will give maximum employee acceptance."

Spreading Word—In announcing a sale, most companies think it's best for morale if a personal announcement is made by the former owners and a top officer of the acquiring company. Often a dinner is given for supervisory personnel. They are given additional details of the transaction and asked to talk them over with their men.

If the plant is one of the principal employers in a small town, community leaders are interested in what's going on. Several firms do what Harris-Seybold Co., Cleveland, did when it took over Cottrell Co., Westerly, R. I. Following a mass meeting of employees, the big manufacturer of printing equipment brought in community leaders, suppliers and customers. The significance of the deal and the future of the company were talked over with them.

When Rockwell Mfg. Co., Pittsburgh, acquired the Locomotive Finished Materials Co. (now LFM Division), a brochure highlighting LFM's operations at Atchison, Kans., and St. Joseph, Mo. was prepared. It was sent to all LFM employees to convey a "glad to have you with us feeling." Included was a note from President W. F. Rockwell Jr., stating: "LFM President William H. Machnic and Financial Vice President Chester L. Mize Jr. will become key personnel of our company. They will continue to manage the business."

Confidence—Many firms agree you have an advantage if you can

How To Head Off Problems Relating to Personnel

1. Keep negotiations as quiet as possible
2. Try to head off rumors before they start; employee morale can be seriously damaged
3. When the deal is finally arranged, be sure employees know about it before outsiders, including the press. Make an in-person announcement if possible. Tell the whys and wherefores of the transaction
4. Lay your cards on the table about things like job security, company policies that affect personnel. Stress how the merger will benefit employees
5. Be sure you let the union know what is going on
6. Integrate acquisitions by evolution rather than revolution, but if drastic steps are necessary, explain them fully to all people involved. You benefit if you can soften their resistance to change
7. Watch your own backyard if yours is the acquiring firm: Employees are likely to wonder about possible transfers of operations and personnel, about expanded or lessened job opportunities

NEA

Attorney General Herbert Brownell Looks at Mergers . . .

Merger activity has long been recognized as having a major impact on the competitive structure of American economy. The high degree of industrial concentration which has characterized and still characterizes certain segments of our economy stems largely from waves of merger activity.

This administration aims at vigorous enforcement of our antitrust statutes to preserve the free competitive enterprise system which has done so much to build the U. S.

By its 1950 amendment of section 7 of the Clayton Act, Congress sought to patch up holes developed in the act in its previous 36 years of life. The change fundamentally prohibited acquisition of assets as well as stock of a corporation where it may result in a substantial lessening of competition or tends to create a monopoly. It does not require that the merging corporations be competitors for the prohibition to apply.

Congressional committee reports make it clear that one purpose is to permit intervention by the government in the merger process where the effect may be a significant loss in the amount of competition—even though that effect may not be so far reaching as to amount to a combination in restraint of trade, a monopoly or an attempt to monopolize.

There are certain considerations we feel must be examined and weighed before reaching any conclusion as to whether a proposed merger runs afoul of the Sherman or Clayton acts.

1. The location, physical and financial size, past acquisitions, products and activities of the merging companies individually and in combination.
2. The structure and size of the industry in terms of production and capacity.
3. The relative position in the industry of the two companies, individually and combined.
4. The ease by which new competitors may enter the industry.
5. The number of companies active in the industry, their respective size and relative standing in sales and total assets.
6. Sales, relative standing and like factors of the two companies and their competitors in definable market areas.
7. The nature of the industry—infant, dynamic or declining.
8. The effect the proposed merger may have on sources of raw materials and methods and patterns of distribution.
9. Whether the acquisition may result in a significant reduction in competition.
10. Whether the acquisition may increase the relative size of the purchasing company in such a fashion as to give it a substantial advantage over its competitors.
11. Whether the relationships between the purchaser and other companies that may be brought about by the merger might result in a lessening of competition.

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keep former top management on. Workers feel they have someone they know to go to bat for them. Other ways to make friends: Use company bulletin boards to supplement verbal information; follow up in employee publications with information on both the acquisition and parent company. Letting key men among new employees in on growth plans of the parent company is also a morale builder. Hupp Corp. uses its Key clubs to do this.

Acquiring companies sometimes find they have to raise management salaries to bring them in line; cuts are rare. If a man's salary is considered too high, he will usually be asked to take on more responsibility rather than accept less money.

Other Common Problems

If you're worried about antitrust aspects of the merger or acquisition, you can ask the Justice department for a premerger clearance. If you get it, it means that the department (on the basis of available information) does not intend to institute proceedings if the deal goes through. But it's no guarantee. The department promises to, and apparently does, keep secret any information it gets from parties interested in merging.

Silence Golden—Secrecy during negotiations is essential. If news

John Gwynne, FTC Chairman, Wants Changes in Laws . . .

It is always interesting to philosophize about the reasons for mergers and to speculate as to their probable result on the economy. Nevertheless, Congress had definitely charted the present course.

The law bans all acquisitions where in any line of commerce in any section of the country the effect may be substantially to lessen competition or to tend to create a monopoly.

First of all, this requires an examination of many mergers; we have found this to be a time consuming and expensive process. Often the conclusion is that the particular merger is not banned by the law. It would seem that the interest of all would be promoted if that simple fact could be determined earlier and with a minimum of expense and trouble.

Some time ago the commission recommended an amendment to the law which would require a reporting 90 days prior to a proposed acquisition if the combined assets were in excess of $10 million. That amendment should also be helpful to those considering a merger. We may assume that counsel approving an acquisition has concluded that it does not violate the law. He should be interested in getting the facts on which he based his judgment before the commission's staff as soon as possible.

Despite the frequency with which they occur, the setting up of a merger is still a major operation. Some time must necessarily elapse between the tentative decision to merge and its final consummation. If the proposed notice is given at the earliest possible moment, this period could run concurrently with the required 90-day period.

Another provision which has the recommendation of the commission would authorize the agency to bring suit to prevent and restrain violation of section 7 of the Clayton Act and to require maintenance of the status quo. At present, the FTC has no adequate law for this.

Another recommendation is an amendment which would finalize all Clayton Act orders like orders under the FTC Act now become final. At present, the commission must prove violation of the act before a cease and desist order may be issued. Additional proceedings in court must follow before a judicial order commanding obedience can be secured. Even after that, proof of violation of the order must be made before the respondent becomes subject to penalty.

Many other suggestions have been made for amending those portions of the antitrust laws relating to mergers. No matter how the law may be written, it will pose a difficult problem. The questions presented are complicated; probable results are of great consequence. Every case will need to be thoroughly investigated and analyzed before any decision is made as to the filing of a complaint.

The trying of cases under section 7 is a long and tedious process. The practical application of the new law to cases is still ahead of us. In many important respects, it is yet to be made.

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of an impending merger or sale gets out, it can wreck employee morale and affect dealings with customers and suppliers. That's one reason industry opposes the 90-day prenotification advocated by Federal Trade Commission's Mr. Gwynne (see above).

A seller is often as interested in the buyer as the buyer is in him, especially if he is going to get part payment in stock or is going to continue active in the business. Owners often will want assurance that: 1. The business they built will continue. 2. It won't be removed from the community. 3. Its identity won't be submerged.

So You're Going To Buy

Remember that your needs may change. Keep your program flexible. Harris-Seybold does. Its growth plan originally emphasized two approaches:

One—Intensive research and development to improve products and create new one.

Two—Acquisition of established companies in related fields.

Now that its printing line is well rounded, the company's interest is being broadened to include: 1. Other heavy equipment fields — where the basic problems of management, product research, manufacturing and financing have much in common. 2. Newer growth

Good Buy or Good-By?

A check list like that below is at best only a guide. At worst, it can be an excuse for inaction. Executives who use such a list say it still leaves room for a lot of seat of the pants flying.

The toughest part of any merger is the final decision: To merge or not to merge: The final tests: Does it fit our plans? Will it make money for us? In considering a company, check its:

1. **Corporate Background**
2. **Terms of Proposed Acquisition**
3. **Financial Status**
4. **Products**
5. **Sales**
6. **Management and Industrial Relations**
7. **Facilities**
8. **Production Methods and Processes**
9. **Engineering and Research**
10. **Controls**

industries—like electronics—which might supplement the company's research and could provide diversification into light product fields.

Case in Point—A good case for flexibility: You might set your guide posts too high. Elgin began seeking firms in electronics or precision production instruments. It thought an "ideal" firm would have: 1. Profitable operations over the last two to five years (operating profit of about 15 per cent). 2. A rapidly growing sales volume with demonstrated potential. 3. Net worth on the order of $1 million. 4. A high degree of engineering background and talent. 5. An established distribution setup.

Now that they have experience using those guides, Elgin executives comment: "If we'd stuck to them strictly, we wouldn't have bought a company. But they did give us something to aim at."

Is It a Bargain?

Some executives say good firms that are for sale are scarce and getting scarcer because of the merger wave. Others maintain that's true in just a few fields. There still are good buys, though real bargains are hard to find.

Evaluating a firm you're interested in can be a tough job. Merger-minded executives admit that beyond applying your over-all criteria, there is no easy way out. One company was exposed to 450 offers, took action on only 15.

For an evaluation guide, see list at left. But remember it's only a guide. "You've got to look at the trends," declares R. G. Fisher, director of economic research, Continental Can Co., New York. "On a flash reading, a company may look increasingly profitable, but the trend in its products may be leveling off or heading down. There's no common denominator in this merger business; you always have to make a complete picture of each case."

Tested Methods—Rockwell Mfg. Co. gets a line on potential new lines or products by asking district managers: Could you sell it? Plant managers: What do you know about making it? Engineers: Is the product compatible with what we have?

Other questions to be considered, says A. C. Daugherty, assistant to the president, are: Will it compete with your customers? Do you want to?

In determining a price, always look at prospects and past earnings, advises Robert Murphy, vice president and general counsel, Borg-Warner Corp., Chicago. "Those are crucial items."

Money Matters

"We go through the same motions with a $1-million company as we do with a $20-million company," says Charles Strang of Koppers Co. Inc., Pittsburgh. "One of the main hurdles during negotiations is the tax angle. The seller wants a tax-free deal; the buyer has to look at possibilities for depreciation, etc. We've had deals blow up over the way to buy."

Tax Aid—A good tax lawyer can be a big assist in telling you if it is to your advantage to consider tax-free acquisitions. For the seller, it's a matter of considering what he already has. The buyer will want to look at depreciation; if book value is low, in a tax-free merger, you have to take over the assets at that value even if you pay more. In a deal that is not tax-free, you have a basis to write off at the purchase price.

To make the transaction tax-free, you must pay off in voting stock and acquire substantially all the assets (about 90 per cent of

net worth) or more than 80 per cent of the company's stock.

Stock or Cash? — In deciding whether to pay stock or cash for stock, remember that if a large number of stockholders are involved, you may have to go through the mechanics of a public offering of your stock. If you buy assets, that problem doesn't come up. By buying assets, you also may avoid minority stockholder problems.

A possible way to avoid price haggling: If you don't think the property is worth the asking price, make a provision for added participation by the seller if earnings are larger than anticipated, advises John O. Ekblom of John O. Ekblom & Co. Inc., New York, chairman of acquisition-minded Hupp Corp.'s executive committee.

When a decision to deal has been reached, get a 60 or 90-day option to buy. Occasionally, a third party will get control of a company when a selling transaction is winding up and try to get a higher price for it. The option gives you a chance to back out.

Integration

Something to be decided in advance of final acquisition is how much integration you're going to do. Factors that will bear on your decision are the size of the company, its products and the amount of management it already has. Highly decentralized firms like Borg-Warner prefer to keep an organization intact.

The problem is to find the line between introducing necessary changes as rapidly as possible and arousing resentment by giving the impression "we're going to do it our way tomorrow." "You try to keep original supervision at a minimum," comments Mr. Elliott of Crane Co. "On the other hand, you can't let the tail wag the dog either."

Understanding — A number of executives name communications as the biggest problem. "Words don't mean the same thing to all people," observes Continental Can's Mr. Fisher. "On paper, company policies don't read alike to different men. Under old management, a man knew where to go if he needed something; under the new, he might not be sure."

He recommends: "Don't move in with a heavy hand. Try to bring your policies to the fore over a year or two. Limit commands as much as you can; as people in the acquired company recognize something as a better way, they will adopt it."

So You're Going To Sell

Byron Jackson Co., Vernon, Calif., was doing an annual business of $30 million plus (pumps, oil tools, rubber products, electronics and oil field services). Here are reasons President E. S. Dulin gives for becoming a division of Borg-Warner Corp.:

1. Borg-Warner is highly decentralized; each division has freedom and responsibility normally associated only with an independent company. We look forward to the continuity of Byron Jackson's management and policy greatly strengthened by Borg-Warner financing and outstanding staff

Finding Companies Interested in Merging

In 1953, Elgin National Watch Co. undertook a planned diversification program. Needed were: 1. Higher return on investment. 2. Greater long-term stability. 3. Major expansion in business.

Elgin's major asset is its reputable name. Its abilities are in measurement, manufacturing, organization, marketing, finance.

Balancing needs against assets and abilities, Elgin executives decided that miniature electronic components and production instrumentation offered the best opportunities for growth and utilization of their highly developed manufacturing and other skills.

The program was kicked off at a press conference in New York. Resulting leads came from:

SOURCE	NUMBER
Direct	29
Investment Firms	25
Business Brokers	22
Banks	19
Elgin Personnel	14
Business Associates	6
Trade Associations	5
Consultants	3
Publications	3
Lawyers	2
Factors	1
Total	129

Leads, including the initial surge, now total over 200. To date, Elgin has acquired three West Coast electronics firms. They now make up its electronics division. Still being looked for: New interests in the electronics field, an entry into production instruments.

Prepare for Integration Problems

Executive Compensation and Titles

Either work out as part of the merger negotiations or allow the status quo to exist until time takes its toll.

Sales Compensation and Management

Don't rush in too quickly to evaluate sales-management performance in unfamiliar fields, but, sooner or later, parent company policies will have to prevail.

Interplant Sales

How about salesmen's commissions, profit margin allowed the producing plant, the differential—if any—permitted above market price?

Allied Lines

Combination of marketing structures is usually called for, but there are exceptions. Be sure the products sell to the same set of buyers or purchasing agents.

Advertising and Promotion

Determine the relative emphasis to be given the parent company and subsidiary. Check any differences in approach on institutional advertising. Some companies prefer to consolidate all advertising with one agency to be sure of attention from top artist and copy skills even though new acquisition itself may be small dollarwise.

Personnel

How are you going to adjust fringe benefits such as sick leaves, pensions, insurance, medical expenses and holidays?

Finances

Will the acquisition be assessed for a part of home office expenses? Will you have to set up more elaborate accounting systems and step up requirements for reporting on bookings and billings, profit and loss, an annual forecast, budget?

Purchasing

How much integration or co-ordination is practical?

Engineering

This depends on how much your acquisition has to begin with. Some companies plan on local-level work on product engineering; central responsibility for long-range research and development.

services, which will speed our growth plans.

2. Byron Jackson stockholders have the advantage of a much broader market for the Borg-Warner shares they have received.

3. It is my firm conviction that employees and stockholders alike have even greater security and larger opportunity than they enjoyed in the past.

Check Points—If you're evaluating a potential buyer, look at his business position, earning capacity, selling organization, management, personnel policies. See what he has done with past acquisitions.

How many of these advantages will your firm get? 1. Research and engineering facilities. 2. Design and manufacturing talent. 3. Managerial ability. 4. Financial backing. 5. Marketing experience. 6. Foreign connections. 7. Experience with governmental contracting.

The Summing Up

When do you stop merging or acquiring new firms? Some claim you don't. They feel: "As long as there are opportunities in our field and our management can handle them, we'll take them." The middle ground is: Call a halt when you think you've got as much as you can handle efficiently.

Certainly, the informed view is that diversification is not a panacea. You're a weaker company if you double in size while your profit margin drops from 10 to 3 per cent.

Refusal to look upon the merger as an intelligent means of "sudden growth" is just as bad.

Philosophy—To merge or not to merge? If that is still the question, perhaps the key to the whole problem lies in these words by AMF's Gott:

"There is a legitimate analogy between a corporation with a new acquisition and a family with a new baby. The new company, like the new child, does not simply represent the addition of one more member to the corporate family; it changes the relationships of everyone concerned. This requires patient adjustment of the new relationships and readjustment of the old."

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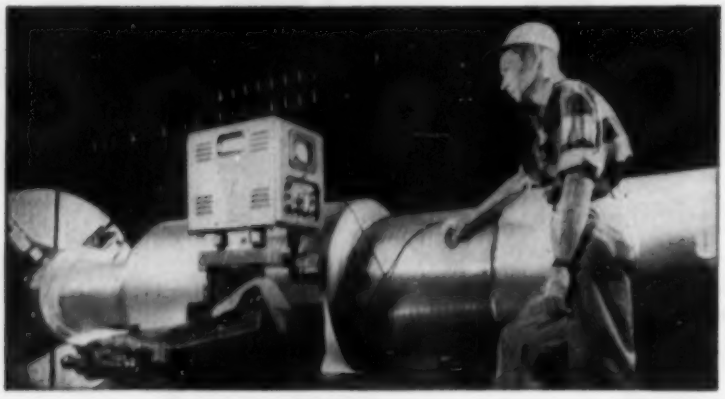
DIVISION OF SPERRY RAND CORPORATION

Sperry

ultrasonic inspection news

HOW ULTRASONIC TESTING HELPS U. S. STEEL PRODUCE FLAWLESS FORGINGS!



This turbine generator shaft—forged and sonic-tested by U. S. Steel – is part of the first nuclear reactor power plant to be built in the United States. The 60,000 kilowatt power plant will go into operation in 1957.

Here, the shaft is being Reflectoscope-tested while it is still in the lathe. The forging will be sonic-tested a *minimum of 5 times* as it progresses through various stages of manufacturing. At U. S. Steel, turbine and generator rotor forgings are tested at these stages:

1. Preliminary sonic test is run on the rough forgings before machining.
2. Forging is rough-turned to bring it into a "round," then sonic-tested again.
3. After a bore has been drilled through the forging, it gets a complete full-scale sonic inspection.
4. After grain-refining (heat-treatment) another sonic test is made.
5. After finish-machining and stress-relieving, the forging is inspected again as specified by the customer.

All these sonic inspections are usually conducted while the forging is rotating, except for the as-forged test. A carbide tool finish is used to provide a suitable surface for the double-crystal search unit.

This testing for defects before forgings are placed in actual operation enables U. S. Steel to turn out flawless forgings that *exactly* meet ASTM and customer requirements. Reflectoscope inspection saves U. S. Steel man-hours and money...helps assure customer satisfaction! It can do as much for you. Use the handy coupon to ask for full information.

THE SHOW'S ON THE ROAD!

Sperry's new ULTRASONIC CARAVAN is now on a nationwide tour of plants and factories throughout the United States.

The Caravan's compact exhibits will demonstrate every aspect of ultrasonic testing and equipment to management and engineering personnel. You will see all types of Sperry Reflectoscopes, signaling and recording devices – in action... in your own plant... using samples of your own materials or products for testing!

If you are located in one of the nation's larger industrial centers, the ULTRASONIC CARAVAN is probably already scheduled to visit your area. If not, your Sperry Representative will be glad to discuss the possibility of a visit to your plant or area.

To keep posted on latest developments in the profitable use of ultrasonic inspection, send for your copy of our Ultrasonic Inspection News Letter.

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sperry products INC.

FIRST IN ULTRASONIC INSPECTION

STEEL

August 13, 1956

Technical Outlook

STAINLESS RINGS—Look for better oil mileage and increased engine life from stainless steel oil rings. Sealed Power Corp., Muskegon, Mich., uses Allegheny Ludlum's type 201, says it works better than 301. Work hardening makes wear characteristics excellent. Other advantages: Corrosion resistance and antifouling efficiency.

QUICK CHANGE PRESS—A new Clearing press has a double size bolster which rolls under the press on tracks. One-half the bolster is always outside the press. While the press is operating with one set of dies, a second set can be installed on the vacant half of the bolster. To speed die changes, the upper die is locked to the press slide with fast acting hydraulic clamps instead of bolts.

LARGE BILLET HEATER—Loftus Engineering Corp., Pittsburgh, has installed induction heating equipment at Revere Copper & Brass Inc., Rome, N. Y., that will feed more than 10 tons of billets an hour to a 3500-ton extrusion press. Six induction coils, mounted parallel to one another, heat copper, brass and cupro-nickel billets to extrusion temperature. The 2400 volt, 3 phase, 60 cycle power source supplies the 6000 kva needed.

PUSH ON TITANIUM—The Titanium Steering Group of the Department of Defense has a program to get new titanium alloys into production faster. An alloy selection committee visited all producers to survey data on new alloys. The U. S. Navy Bureau of Aeronautics is contracting with several producers to make ingots to be processed into sheets. They will be thoroughly tested for aircraft use. Rem-Cru Titanium Inc., Midland, Pa., announces it will produce two new alloys under the program: 1. A 3 per cent Al, 6 per cent Mo alloy. 2. A 4 per cent Al, 3 per cent Mo, 1 per cent V alloy. They will be flat rolled in the solution treated and quenched condition. After forming into airframe parts, they can be aged to extremely high strength levels.

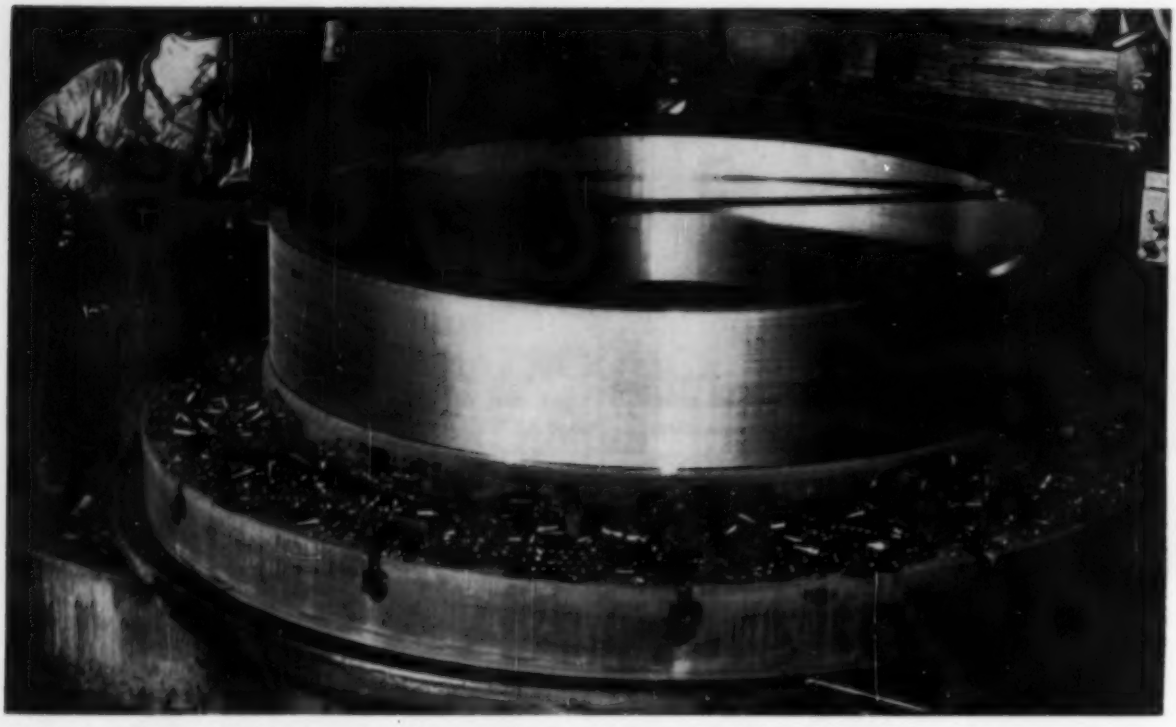
MISSILE GUIDERS—It's like building a television set with tolerances in millionths of an inch that will run after being dropped from a skyscraper. That's the way Maj. Gen. Bernard A. Schriever characterizes the problems of developing missile guidance systems. Superaccurate gyroscopes hooked up to electronic gear are the heart of the guidance mechanism.

CORE MATERIAL—Flakenol I is a new nonstrategic magnetic material for use at most communication frequencies. It was developed by U. S. Naval Ordnance Laboratory, Silver Springs, Md. It's a flake form of an iron-silicon-aluminum alloy with a built-in aluminum oxide coating. It's expected to be competitive in cost with high nickel alloys and surpass them in performance in many cases.

SOLVES PROBLEM—Mueller Brass Co., Port Huron, Mich., is solution heat treating chromium-copper alloy rods ½ to 2 in. in diameter and up to 12 ft in length without distortion. It's done vertically in a salt bath furnace made by Ajax Electric Co., Philadelphia.

NEW TUBING—Superior Tube Co., Norristown, Pa., announces it's making tubing from Ni-Span C. Applications in the picture: 1. Instrument bellows, magnetostriction devices and similar applications where the alloy's constant rate of expansion is useful. 2. Bourdon spring tubing where the alloy's uniform modulus of elasticity, low drift and hysteresis are valuable.

Metalworking Outlook—p. 43 Market Outlook—p. 137



Big boring mill at Alco's Latrobe, Pa., plant is used to machine new leaded steel forged rings

New Technique: Lead in Steel Forgings

You can machine circular forgings easier with this material. Advantages claimed for the secret process: Good distribution of lead, bigger leaded ingots

LEADED STEEL produced by a new method that's a closely guarded secret adds a machinability bonus to large gears and forgings made at Alco Products Inc.'s, Latrobe, Pa., plant.

A number of test rings have been machined by customers. Checking results with those of comparable grades of nonleaded steel, they report 47 to 71 per cent time savings on turning operations, and 20 to 50 per cent slashes in gear tooth cutting rates. They say tool life has been upped 46 to 94 per cent. Improved surface finish was reported in every case.

The Reason—C. R. Funk, Alco's chief metallurgical engineer, says: "Behind this development rests a problem of concern to all makers of high quality forgings: To improve the machinability of their product and maintain proper quality.

"The advantages of lead additives have been demonstrated time and again for a variety of applications. Faster removal of metal is made possible by deeper cuts and faster speeds. Less power is needed to drive the cutting machine. An improved machine finish often is possible, even though fewer tools and possibly lower cost tool steels are used.

"In short, leaded steel would appear ideally suited to the machining requirements of forged and rolled ring products and other forgings requiring heavy machining operations."

On the Market—The result of a two-year research program, Alco's Hi-Qua-Led is available in forged or rolled rings with outside diameters of 18 to 145 in.

Mr. Funk emphasizes that the leaded steel responds to heat treatment the same as nonleaded. The presence of lead apparently has no effect on carbon penetration or hardness for case hardened, induction hardened or flame hardened parts. He says tensile, bend and impact test results on forged and rolled rings compare favorably with those on regular steel rings of equivalent size and grade.

Experience—Customer test reports show that the possible lubricating action of the lead permits faster speeds and deeper cuts than nonleaded stock. In one test, the turning speed was more than doubled and depth of cut increased 50 per cent. Result: Tool life was upped as much as 1600 per cent.

Alco also reports that lead evidently tends to reduce friction between the tool and the part, permitting tools to operate at lower

Machining Comparisons

Operation	Steel	Brinell Hardness	Cutting Speed	Feed	Depth of Cut	Improved Tune	Increased Tool Life	Decreased Tool Wear	Tool Wear
Turning	4137	290–330	2½ rpm	⅛"	¼"	....	....	....	....
	41L37	290–330	6 rpm	⅛"	¼"	69%	....	....	....
Gear	4137	290–330	35 strokes	0.028	....	....	....	....	¼"
Cutting	41L37	290–330	35 strokes	0.028	..	....	1600%	94%	1/64"
Turning	4140	285–302	17 rpm	0.0208	....	....	....	....	....
	41L40	285–302	25 rpm	0.0208	....	47%	....	....	....
Gear	4140	285–302	37.5 strokes	0.0174	....	....	....	....	0.0437
Cutting	41L40	285–302	46.5 strokes	0.0237	....	41.2%	437%	77%	0.010
Turning	4150	255	275 sfpm	0.016 face cuts	....	....	....	....	....
	41L50	255	475 sfpm	0.021 face cuts	....	56%	....	....	....
	4150	255	276 sfpm	0.005 plunge cuts	....	....	....	....	....
	41L50	255	475 sfpm	0.010 plunge cuts	....	71%	....	....	....
Gear	4150	255	89 strokes	0.0237	0.620 Rough	....	....	....	....
Cutting		255	89 strokes	0.0237	0.030 Finish	....	....	....	0.028
	41L50	255	111 strokes	0.0295	*0.620 Rough	21.1%	200%	80%	0.014
	41L50	255	111 strokes	0.0368	*Rgh & Fin	47.4%	187%	46.5%	0.015
Gear	1070	240–260	32 rpm	0.048	0.690	....	....	....	0.020
Cutting	10L70	240–260	40 rpm	0.076	0.690	50%	....	....	0.020

*Free of heavy burrs that had been evident on regular material

temperatures. In some cases, a roughing tool gave a surface finish comparable to that achieved with a finishing tool.

Advantages—Mr. Funk cites two other advantages: High strength materials may be machined on equipment that could not handle nonleaded steel above a specific strength or hardness level.

As a corollary, power requirements are lowered and machine down time for tool changes minimized.

Further Study—Alco is studying surface fatigue and wear. Although Mr. Funk admits it's too early to draw conclusions, he says results so far favor leaded steel. A grade of high-carbon leaded steel, for example, produced definitely improved surface fatigue properties.

The work-hardening effect extended to a depth of 0.1 mm in leaded steel, while it was limited to less than 0.02 mm in nonleaded. Surface fatigue and wear tests are being conducted on 1040, 4140 and 4340 steel.

Top Secret—While no detail of Alco's method of getting lead into the steel is being revealed, it's no secret that it differs from the widely used Inland process (STEEL, Oct. 25, 1954, p. 150). The company admits that the lead content range is about the same as that in the others: 0.15 to 0.35 per cent.

About the process, Mr. Funk says: "During our investigation, we experimented with a new method of adding lead to obtain thorough distribution in any size ingot. The first trial was successful, and soon thereafter leaded steel ingots from 3200 to 32,000 lb were produced, with lead recoveries as high as 85 per cent.

"Ingots of all sizes were sectioned (top, middle and bottom), then studied for the pattern of lead segregation. Sections of these ingots were forged and rolled into rings to 140-in. OD and 22 in. wide."

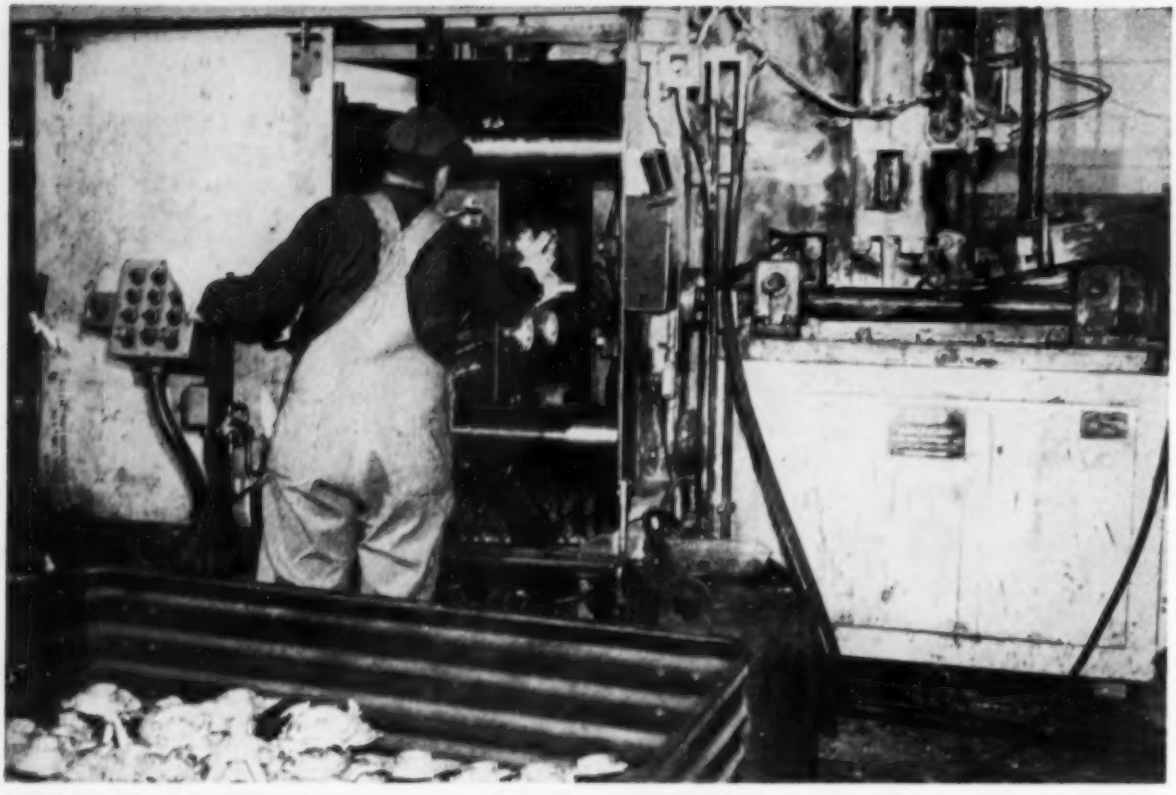
Close Check—Rings were sectioned and studied for lead segregation, impact, bend and tensile properties.

"In each instance," he reports, "excellent lead distribution and recovery were found, while the physical properties of the steel remained basically unchanged."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Typical Properties of Leaded Steel

Alco Grade	Quench Temp °F	Draw Temp °F	Yield Strength (psi)	Tensile Strength (psi)	% Elong. in 2 in.	% Red. of Area	Bhn	Charpy Impact	Section Size
10L70	1580*	1000*	104,250	157,000	14.0	26.5	321	10	10¾x5
10L70	1580	1100	87,000	145,000	15.5	37.0	285	14	14x2⅝
10L50	1580	1100	81,000	142,500	16.5	32.5	269	..	13⅝x8
10L50	1580	1125	72,500	117,000	22.0	43.5	235	35	15¼x3
10L45	1580	1125	68,500	110,000	22.0	44.5	229	41	13¼x2⅝
41L30	1575	1125	105,000	126,000	18.5	52.1	262	73	4½x2½
41L37	1575	1250	100,000	122,000	23.5	62.4	248	73	11¼x11¼
41L40	1575	1175	92,000	118,000	20.0	57.0	235	48	15x6
41L40	1575	1100	106,000	132,000	17.5	46.5	277	30	14x2⅝
43L40	1550	1120	110,000	135,500	17.0	50.7	285	36	9⅝x5
43L40	1550	1100	125,000	145,000	16.5	47.9	311	28	8x4⅝



Operator removes gate of castings from hot chamber machine. Shot end of machine is at right. High voltage arc that controls metal flow is attached to the right side of the shot mechanism

Boost for Magnesium Diecasting

Five new hot chamber machines at AC Spark Plug will produce parts for GM cars. Most of the bugs have been worked out; the process promises high output

AC Spark Plug Division of General Motors Corp., Flint, Mich., plans to have five hot chamber magnesium diecasting machines in operation by the end of the summer.

The company makes magnesium oil filter by-pass valves for Chevrolet. It also is in limited production on fuel pump parts—bodies for the vacuum and combination types. When the new line goes into operation, AC expects to increase production of all parts.

Process—Hot chamber magnesium diecasting is fairly new. Under the Dow Chemical Co. method, molten magnesium is kept in a holding furnace at 1180 to 1200° F. A transfer tube carries the metal to a Stillwell furnace. An electric metal level detector automatically controls the amount of magnesium in this furnace.

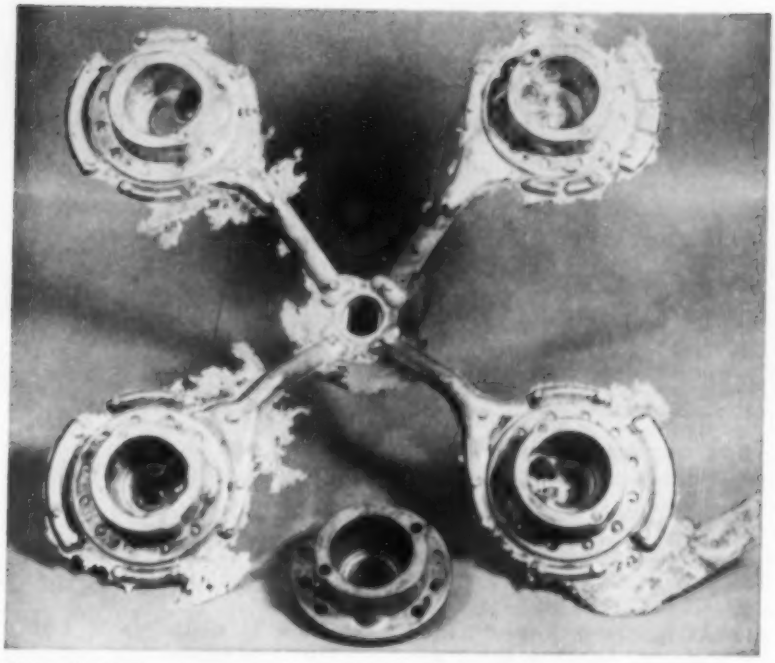
When the cast is made, a shot piston forces magnesium through a gooseneck and into the die. Castings are removed manually; the sprue is lubricated; and the process is repeated.

Rate—Production of the by-pass valve averages 220 to 240 an hour in an 8-hour shift. Peak production is about 300 an hour.

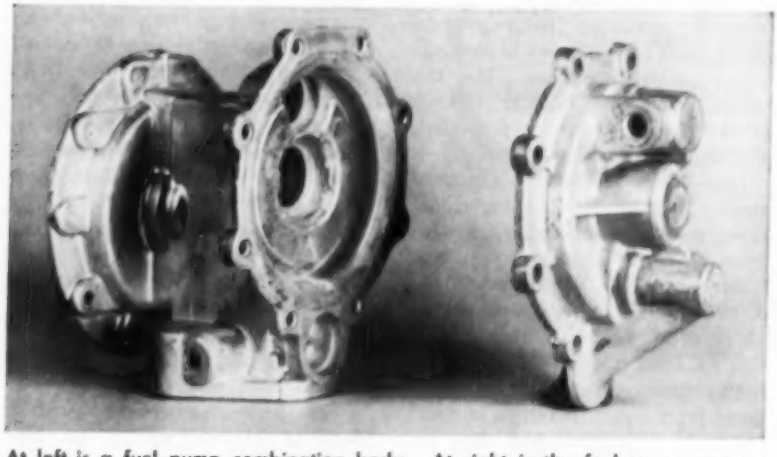
The hot chamber machine is capable of higher production, but Harry E. Eriksen, supervisor of production engineering for diecastings, explains: "We don't pay on a piece rate basis because we're more interested in quality. Our rejects on by-pass valves are less than 1 per cent."

Savings — AC reports that it costs about $88 to cast 1000 lb of magnesium, compared with $180 for a similar amount of zinc. Although the initial cost of magnesium alloy is higher, Mr. Eriksen points out that it takes only half as much metal to make a casting.

"Magnesium machines beautifully," he adds. This results in a shorter finishing line, faster in-



Gate of oil filter by-pass valve castings. Flashing is removed on trim press. Finished casting is shown at bottom



At left is a fuel pump combination body. At right is the fuel pump vacuum body. Both are hot chamber magnesium diecastings

spection, savings in machining and handling.

Alloy—AC uses AZ 91-B. It contains 8.3 to 9.3 per cent aluminum, 0.4 to 0.9 per cent zinc, a minimum of 0.13 per cent manganese and a trace of beryllium.

Die material is H-13, which contains 5 per cent chrome. Mr. Eriksen says that die life lies between the 125,000 casts for aluminum and the million for zinc. Probable die life for magnesium models is about 500,000 casts.

Problems—"A clogged transfer tube, sticking shot plunger and oxidation in the furnaces were our biggest headaches," he says.

In the original setup, the transfer tube between the holding and Stillwell furnaces had a gooseneck at the end of it. Interior valves helped to control the flow of magnesium. These valves sometimes stuck or corroded.

New Tube — In addition, the holding furnace has to be cleaned about once a month to get rid of ferrous oxide deposits which could cause a thermite reaction if combined with magnesium.

In its new line, AC will install straight tubes without the gooseneck bend. The tubes will have flanged joints so they can be removed easily and each tube and holding furnace can be pushed back for cleaning.

Plunger—Another problem was the binding of the shot plunger in its sleeve. Dow Chemical engineers corrected this defect by developing a special metal for the plunger tip.

Molten magnesium will burn when it comes in contact with oxygen. This means that oxygen must be excluded both from the holding and Stillwell furnaces.

Powdered fluxes, developed by Dow, work well in the holding furnace, but engineers discovered the fluxes could cause corrosion in castings and dies. Sulphur dioxide, fed into the Stillwell furnace, forces out oxygen.

Finishes—When it started casting magnesium, AC discovered that magnesium corroded rapidly under certain atmospheric conditions. Surface protection is needed, so a modified chrome pickle process is used on fuel pump parts.

Company engineers say at least one area still needs some development. Magnesium cracks in the die in sharp corners or in areas of abrupt section change. Casting pressure and temperature, different alloys and improvement in product design (large fillets and radiuses) seem likely study areas.

Advantages—Mr. Eriksen suggests that cold chamber diecasting still is suitable for some materials and processes, particularly where a dense casting is required.

He adds: "We have found, however, that our magnesium casting rate is higher than that of zinc because faster cooling shortens the over-all cycle. In addition, in an engine oil bath at temperatures of 350 to 400°F, zinc parts will start to flow under pressure. Magnesium is good for these applications because it doesn't creep."

Future — AC feels it has just scratched the surface. As proof of this, the company plans to reserve one of its five hot chamber machines for experimental work.

Chemical Locknut

Liquid seal hardens in joints between metal parts, becomes heat and oil resistant plastic

THREADED fasteners can be sealed by a new chemical product so vibration can't shake them loose; but they can be removed with ordinary tools.

Called Loctite, the sealant is a clear thin liquid which hardens automatically when confined between the surfaces of closely fitted metal parts. It forms a strong heat and oil resistant plastic seal which has high shear strength.

Action—The catalytic action of the metal surfaces, aided by the absence of air (which acts as a stabilizer), causes the liquid to harden and form the tough plastic.

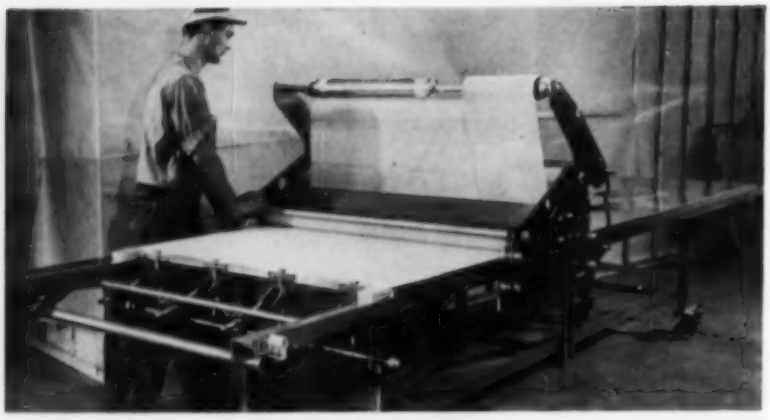
The material will remain liquid for months in its original container, for days as a film on metal parts prior to assembly. A penetrating liquid, Loctite will wick into the joint between a nut and bolt and harden within 24 hours.

Application—Small fasteners can be treated in large lots by briefly tumbling them with the sealant. For larger fastenings and for noncontinuous production operations, the workman puts a drop of liquid sealant on each critical fastening at the last station of the assembly line. Each method is effective.

The sealant manufacturer, American Sealants Co., Hartford, Conn., says the product can be used in any fastening operation—from aircraft assemblies, where vibration and weight are critical points, to machinery designed for high operating speeds and rotary power lawnmowers which are subject to vibration.

Aluminum — It is particularly difficult to hold aluminum fasteners tight in use. The metal is too soft for use as spring lockwashers, and steel lockwashers used with aluminum fastenings cause galvanic corrosion. Loctite will seal aluminum fasteners without corrosion and without the need to tighten them up to the point where threads may strip.

Other possible uses include sealing pores in metal, pipe joints and other leakproof fittings.



Tape applicator takes the difficulty out of . . .

Protecting Metal Finishes

METAL fabricators know the value of protecting polished metal surfaces with pressure sensitive tape. They also know that it's a time consuming and difficult job to put the tape on by hand.

A new machine, the Tape-Master, applies tape quicker, and without wrinkles or waste. It's the brainchild of Sod-Master Corp.'s inventive executive vice president, William C. Kaercher Jr.

Idea—"Back in 1953 things were slow. I began looking for something new that we could build to promote more business," says Mr. Kaercher of the Minneapolis firm. A call on the Industrial Tape Division of Minnesota Mining & Mfg. Co., St. Paul, turned up a lead.

The division was holding a request from a southwestern aircraft company for a protective tape applicator. Mr. Kaercher set out to design and build a mechanism that would determine if wide sheets of pressure sensitive tape could be successfully applied with a straight application roller.

They could, he found out. The only trouble was that the aircraft company lost interest.

A Nibble—The project sat for a year until Bell Aircraft Corp., Buffalo, inquired about a tape applicator. The 3M firm passed the query on to Sod-Master. Bell got the first machine in March.

It applies tape to a maximum width of 5 ft on metal sheets 12 ft long. A second model will apply tape in widths up to 4 ft.

The Tape-Master has two components, an applicator table and a carriage. The table, covered with a durable rug material, is heavy (approximately 1000 lb), but is mounted on legs with rollers and floor clamps so it can be moved easily.

Mechanism — The carriage has two shafts for carrying tape rolls, a large rubber roller to press the tape firmly to the metal sheet, a razor sharp cutter bar, a pickup bar which catches and holds the tape after it is cut, and a follow-up roll which presses the severed tape to the sheet.

Rails, mounted on each side of the table, carry the carriage 2 ft beyond both table ends.

Tension — Successful operation depends almost wholly on one force—tension. Tension drums control the pull on the tape rolls. Tension is adjusted by a knurled knob which controls a clutch and spring assembly inside the drum. Tension variation is necessary because tape rolls vary in unwind pull.

Sheets also are held in tension with four adjustable clamps which are highly polished.

Application time for a 12 ft sheet is about 1 minute a side when the machine is operated by two men. While the present models are manually operated, Mr. Kaercher believes the principle can be applied to a motorized unit.

Hi-Qua-Led...A NEW STEEL MATERIAL

Addition of Lead to Steel for Circular Forgings Lends Cost-Reducing Machinability Without Changing Basic Steel Properties

Since the late 1930's steel manufacturers have searched for a satisfactory method of adding lead to steel for use in circular forgings. Large segregates of lead have been the most important problems to be solved. Now, however, ALCO Products, Inc. has developed a new process which overcomes this obstacle by distributing the lead evenly throughout the steel in a finely disseminated state. It is being marketed under the trade name, "Hi-Qua-Led Steel," in ALCO's rolled forgings, rings and gear blanks.

Development of Hi-Qua-Led

ALCO, in 1954, began a search for a lead-addition method that would cover the entire size range of the company's forged rings and gear blanks – up to 145-inch OD. After initial trials, ingots were produced from 12-in. to 36-in. diameter with lead recoveries as high as 85 per cent. When the ingot sections were forged and rolled into rings, the rings were sectioned and studied for segregation, impact, bend, tensile and other properties. They were uniformly good and lead was distributed as submicroscopic particles. Both ingot and forging sections were completely free of lead segregates. On the basis of these tests, ALCO applied for patents on its lead-addition method.

Advantages in Machinability

Hi-Qua-Led is designed to lower costs in the expensive machining of circular forgings. The lead additive in Hi-Qua-Led Steel acts as a lubricant for the cutting action of the tool, and provides faster removal of metal through heavier cuts and faster speeds. The lead reduces friction to a point where heat is minimized in the section being machined. Tools last longer before redressing or replacement. Some machines, too, can be upgraded through the use of Hi-Qua-Led because their present horsepower will perform cuts that were impossible before. On all machines, Hi-Qua-Led can reduce necessary power output and lower machine wear and tear. In cases where labor and machine time is expensive, machines operating at the same power output cut Hi-Qua-Led faster and deeper.

Hi-Qua-Led STEEL

Trade-mark Reg. applied for

Patent applied for on lead-addition method

Steel Properties Unchanged

ALCO has studied ingots in grades 1015, 1029, 1040, 1050, 1070, 4140, 4150 and 4340 steel, with lead added, and the lead distribution pattern has been unchanged. Customer tests for standard physical-property data and response to carburizing, induction-hardening and flame-hardening have shown that Hi-Qua-Led responds to heat treatment in the same manner as non-leaded steels. Fatigue tests of the reverse-bending type show no difference between Hi-Qua-Led and regular steel heat-treated to 145,000 lb per sq in. tensile.

Use of Hi-Qua-Led Forgings

Hi-Qua-Led circular forgings have a wide application in machining operations where a great deal of metal must be removed, where a very smooth surface finish is desired at low cost, in gear-cutting operations, or almost any milling, drilling or boring application. Threading, planing, shaping and hobbing are also more easily accomplished with Hi-Qua-Led steel forgings.

Hi-Qua-Led may be obtained in any size ALCO forged ring. An extensive inventory of Hi-Qua-Led ingots in many grades is already maintained at the Latrobe, Pa. forging plant. ALCO offices in Atlanta, Beaumont, Chicago, Cleveland, Houston, Kansas City, Los Angeles, New York, Pittsburgh, St. Louis, St. Paul, San Francisco, Schenectady, Tulsa and Washington have complete information. Or, if you wish, send the coupon for a brochure that gives Hi-Qua-Led details.

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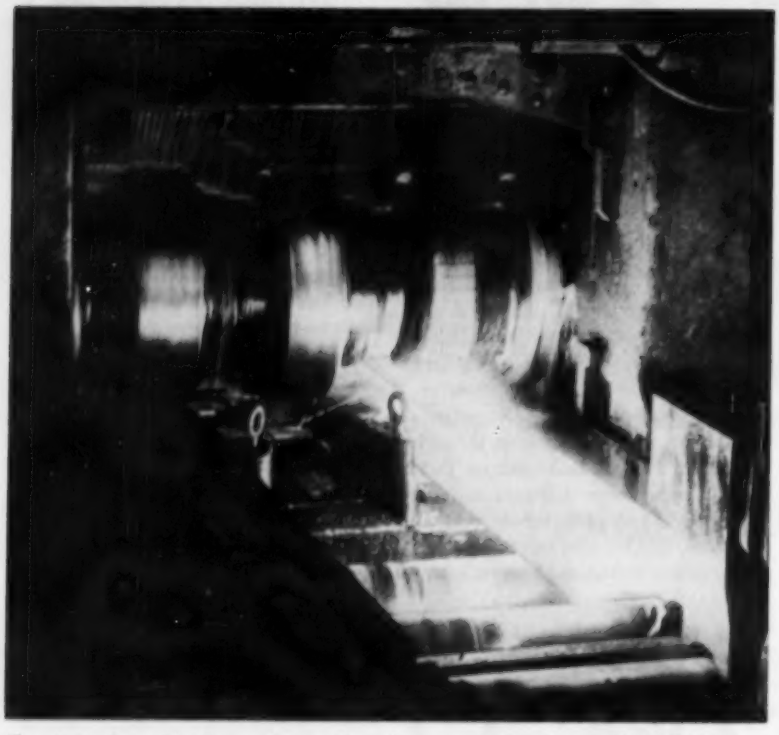


The start of a wide flange beam. Here bloom gets its characteristic "H" shape in the first of five passes through 32-in. breakdown mill

More Wide Flange Beams

Inland Steel Co. now offers full range of sizes (8 to 24 in.). Here is the story of how the company's Plant No. 2 at Indiana Harbor, Ind., operates its revamped structural mill

BUILDERS want more wide flange beams because they're stronger (in relation to their weight) than standard beams. Longer spans and greater unsupported floor areas can be used. Joining surfaces are wider, better.

To satisfy the increasing demand, Inland Steel Co. revamped its Plant No. 2 at Indiana Harbor, Ind., to become the third steelmaker in this country to produce a full range of sizes (8 to 24 in.).

Talk — Inland Steel's W. E. Dittrich told the Association of Iron & Steel Engineers at its spring meeting in Baltimore that wide flange beams are probably the most widely diversified items produced on a structural mill. They have been added to the usual standard structural sections.

Design—One key to the mill's universality is the movability of mill stands. A lifting eye in each stand accommodates a crane hook. The stands can be moved to an adjacent setting-up area while other stands are in operation.

The modernized layout and new facilities were designed and built by Mesta Machine Co., Pittsburgh, which also supervised the installation of the new equipment.

Heart of the modification is a 44-in. universal mill and a 34-in. edging mill which are operated in tandem. Only one man is needed to operate the mill; older models required as many as four. A 6000 hp motor supplies the power.

The new mill is semiautomatic. Electronic controls are preset for the correct roll positions to eliminate some manual adjustments necessary on older mills.

Other new equipment includes a 40-in. finishing mill, two sets of manipulators for the blooming mill, 66-in. hot saw, 66-in. cold saw, gag press, roll straightener, transfer tables, cooling beds, and a 175-ton crane. Buildings have been extended and a new warehouse constructed to handle the additional output.

Route—The rolling starts with 8-ton ingots, 27-in. square by 90-in. long. They are reduced to rectangular blooms for all beam sizes through 6¾ by 14-in. For larger beams, further shaping in the blooming mill is needed.

After blooming, bars are cropped in a 1500-ton shear. It has a 21-in. stroke and will handle cross sections up to 600 in. square.

The bars or blooms are reheated in continuous, three-stage gas or oil furnaces which are about 55 ft long. Each one can reheat 50 tons an hour.

A 32-in., 2-high roughing mill further reduces the bars. Bars are turned 180 degrees between passes to insure symmetry. Flanges are worked in live and dead grooves, alternately.

Next in line is the standard 28-in. mill. This is a 3-high mill with rolls 68-in. long (body) and necks 17 in. in diameter. Top and bottom rolls are manually operated; the middle position roll is fixed.

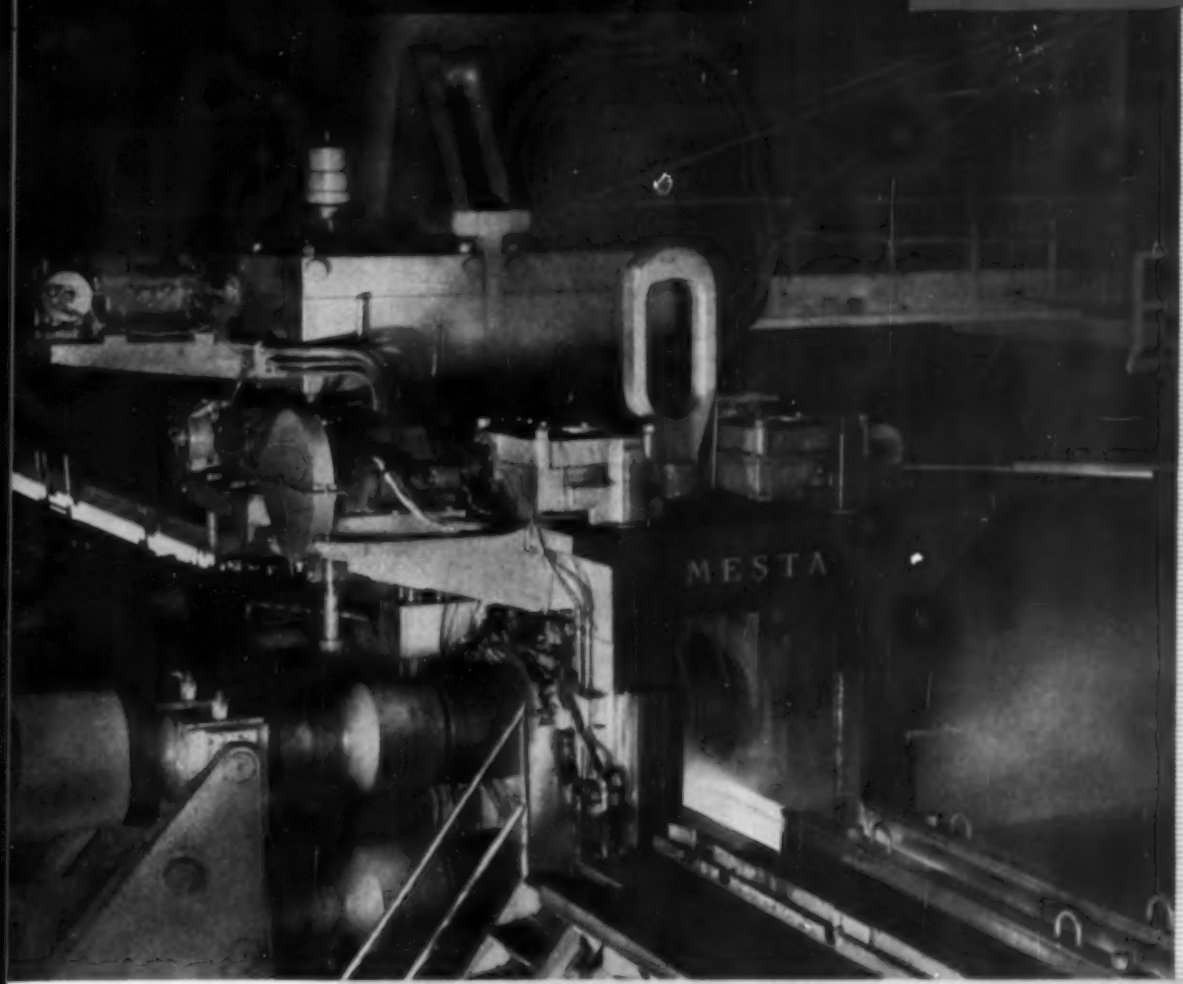
Handling—The same travelling tilt and trailer tables which serve the structural mill handle the bars from pass to pass and from housing to housing. The roll drives for the tables are equipped with variable voltage controls. Bridge and tilt drives have constant voltage control.

When rolling wide flange beam sections, the 44-in. universal mill is substituted for the usual finishing mill. Both the universal and the 34-in. edging mill are adjacent and operate in tandem. The universal mill is 2-high and reversible; the vertical idler rolls are 15 by 34-in., double taper faced. Both horizontal and vertical rolls are held against the screws by 600 psi hydraulic roll balance. A 7000 hp (direct current) motor drives the mill.

There are two separate screwdown systems for the universal mill. One positions the vertical

WIDE FLANGE BEAM AND STRUCTURAL MILLS

Designed and Built by MESTA



MESTA Universal Structural Mill rolling wide flange beams on the 44" Universal Stand and the 34" Edging Stand at Inland Steel Company, Indiana Harbor Works

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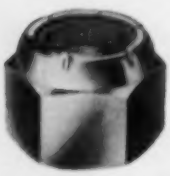

Each hammer-stroke of this 270-foot pile driver delivers a 24-foot-ton wallop! It was built by Raymond Concrete Pile Company to drive 200-foot pipe piles for the foundation of units being added to the B. C. Cobb Steam Plant of Consumers Power Company, at Muskegon, Mich.

Raymond makes a practice of using Elastic Stop® nuts for bolting together sections of leads and booms on all their pile-driving equipment. The red elastic locking collar of these vibration-proof fasteners has successfully maintained its grip under these severest of all vibration and impact conditions!

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rolls; the other, the top and bottom horizontal rolls. Screws can be separated by a clutch mechanism to permit independent operation.

Flange Width—The supplementary edging mill controls the flange width. It is a 33 by 34-in., 2-high reversing mill. Roll necks are 16 in. in diameter. The elevation of the bottom roll is fixed and level with the last pass in the 44-in. universal mill.

Suitable guides are provided to direct the bar into the universal and edging mills. The top delivery guide on the universal is connected to the edging mill's top entry guide. The bottom guides are connected similarly. Guide width is critical since only proper adjustment will prevent the beam flanges turning down.

Good beam production depends on precision roll settings. The rolling scheme requires symmetrical and proportional reduction from pass to pass. Lack of symmetry from either the 28-in. mill pass or the 44-in. universal will produce off-center webs, variable flange thicknesses and widths.

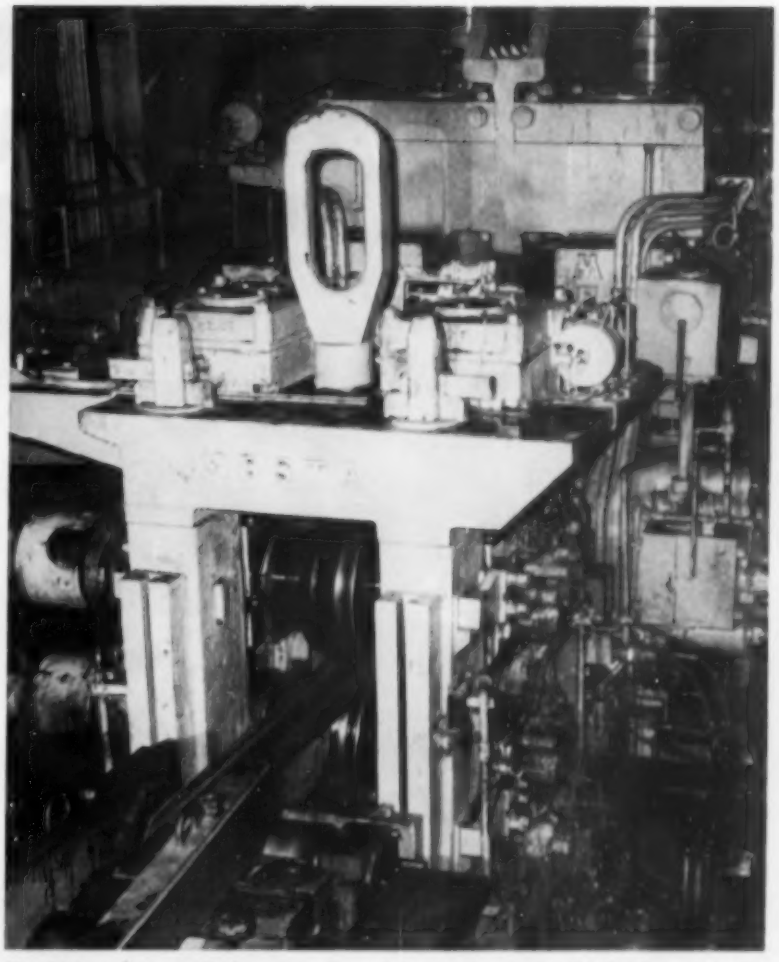
To accomplish uniform reduction in the universal mill, the screw system positions the rolls uniformly in preset drafts. In 12 passes, a 16 ft bloom is elongated to 180 ft. The 44-34-in. mills currently operate at 900 fpm. A high of 1800 fpm is possible.

Scheduling — A single operator controls the direction and speed of the horizontal rolls with a foot switch. He uses a handmaster to control the table rolls; screws are set with a pushbutton. Settings are repeated without variance simply by pressing a button—it is more accurate and rapid than a manual system.

Each screwdown has two scheduling panels. Roll openings are set by a slide contactor. Each panel has a capacity for 11 presettings.

Rolls move to the setting without overshooting or inching. Lights indicate each screwdown to double check the screwdown setting.

The panel has an emergency manual operation. It has priority over the automatic system, but allowance is made for continuation of the automatic at the next setting. The system has an "advance one pass" and a "return one pass"



The 34-in. edging mill (foreground) and the 44-in. beam mill (background) are the heart of Inland's wide flange beam operation. Built by the Mesta Machine Co., Pittsburgh, they are operated in tandem by a single operator

to compensate for out-of-step conditions.

Finisher—After three passes in the tandem (44-34-in.) mill, the bar passes on to a 28 by 40-in. universal finishing mill. This mill is adjusted by wedges under the shoes to line up the pass line and the table rolls. This eliminates tilting tables.

After the finisher, the bar passes through the hot saw to a 135 x 150 ft cooling bed. When sufficiently cool, the bars are roller straightened, although a new gag press is available. After inspec-

Final inspection in the finishing department. Beams are transferred to storage by gantry cranes

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MASS PRODUCTION FORMING processes have no effect on the uniform, tight zinc coating of Republic Continuous Galvanized Sheet Steel. Result is long-lasting corrosion protection without costly dipping. Further finishing can be eliminated.

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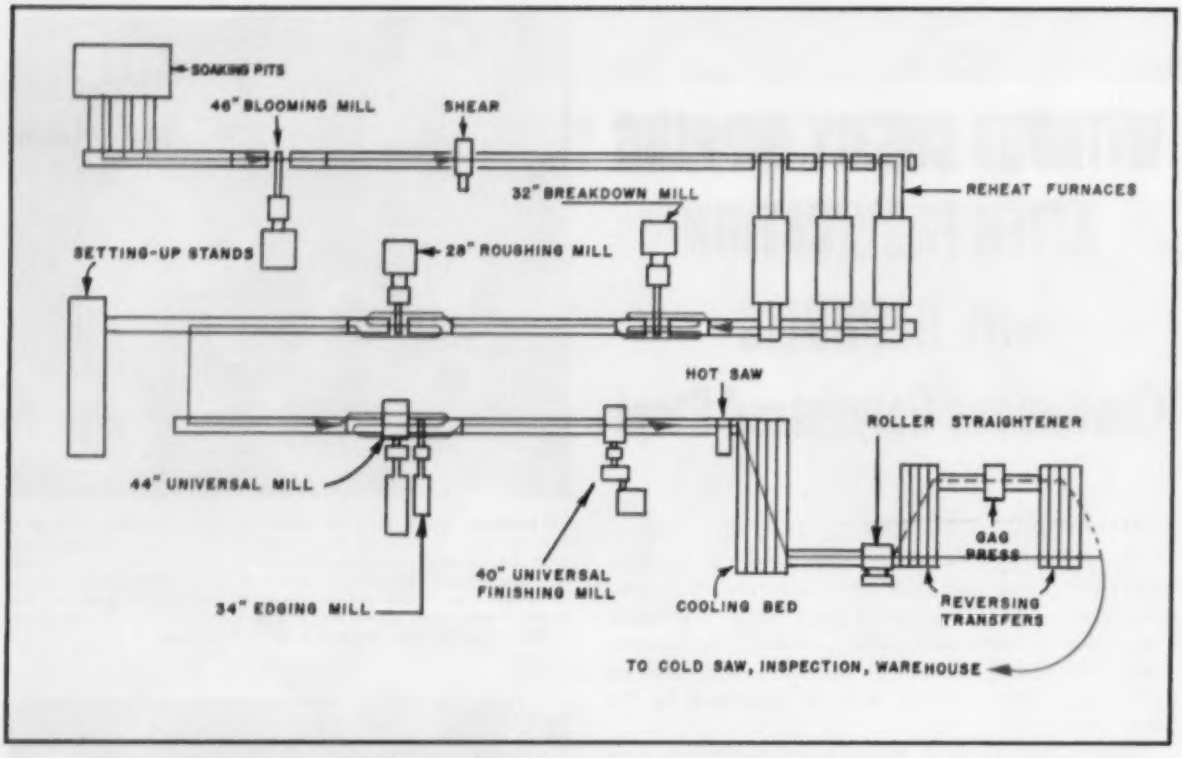


Schematic layout of Inland's structural mill (adapted). Blooms move from the soaking pits through the various stands, end up in storage (far right)

tion and cold sawing, the product is moved by two cranes.

First — According to Inland's engineers, the roller straightener is unique. It has eight rolls. The top four rolls are powered by a 750 hp, direct current motor; the bottom four are idler rolls. Manually operated couplings separate the screws for leveling. The bottom rolls can be moved vertically or horizontally as needed.

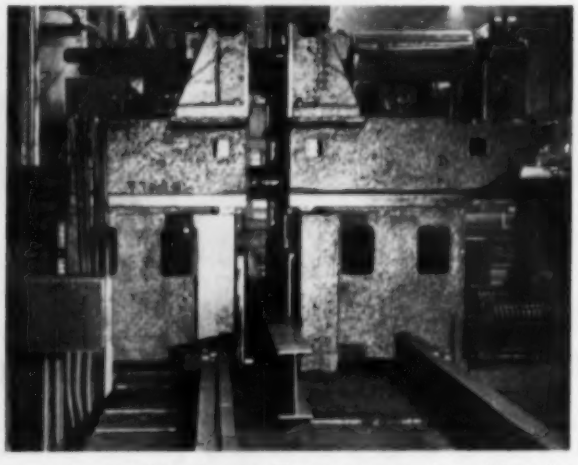
The roller straightener can be retracted entirely by a screw drive and replaced by an electrically driven filler table.

Completion—The re-engineered plant began operating in October, 1955. Capacity for wide flange beams only is 325,000 tons annually. This is limited, of course, by the tonnage of other products rolled: The total capacity of all structurals is 500,000 tons a year.

For the last two years, the demand for wide flange sections has far exceeded supply. Even with this plant, there won't be enough production to satisfy everyone.

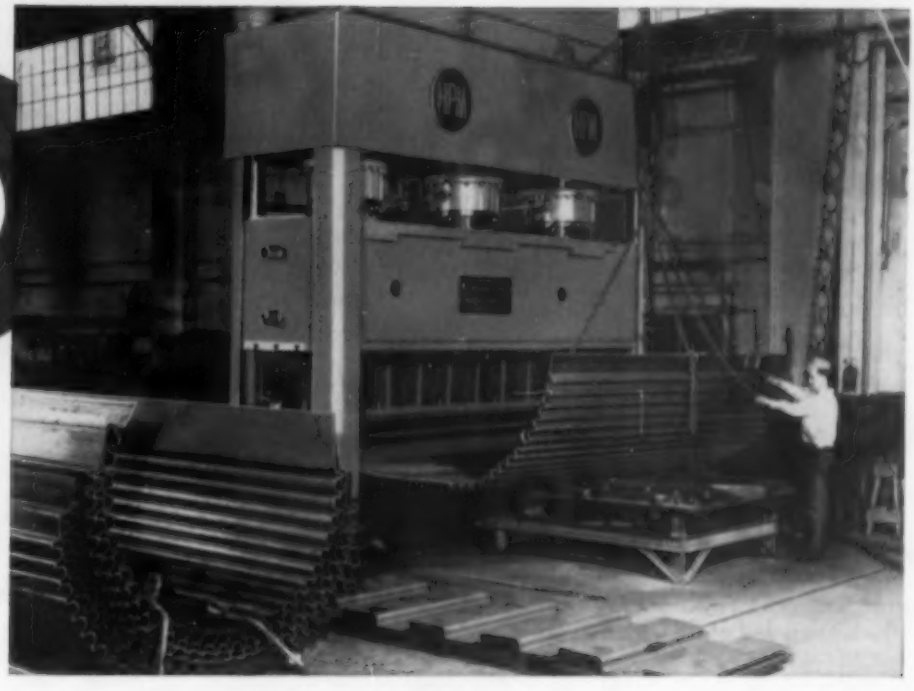
• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

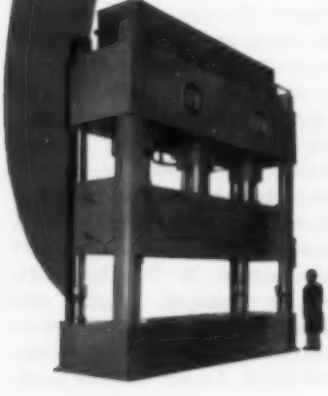
This straightener (Mesta Machine Co., Pittsburgh) is said to be the only one of its kind in this country. Beams enter on the far side. Only top rolls are powered. An alternate way to straighten beams: The gag press. It is driven by a 150 hp motor. Ram side oscillates 35 times a minute. Retracting screws (bottom) move machine out of line



Permanent Wave for ½" Plate

PLATE SHOWN ACTUAL SIZE





Special H-P-M Press Corrugates Heavy Steel Plate Annealing Boxes

For rugged, heavy duty jobs—special metal forming requirements of all types—manufacturers like National Annealing Box Co., Washington, Pa., rely on H-P-Ms. This special frame, long bed, 1500 ton H-P-M will handle steel plate up to 180" wide. Half inch plate (as illustrated) is formed into cylindrical or flat corrugated sheets which form the walls and covers of annealing boxes. These corrugations are 2" deep, well rounded for strength, formed one at a time.

For your toughest jobs choose H-P-Ms—standard and special Fastraverse, self-contained presses are easily adapted to countless applications. Call your H-P-M field engineer at the planning stage. Here's worthwhile experience for you!

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HPM

The business end of the work fixture with six rotors being positioned

Finish Grind with a Wet Belt

Greater flexibility, faster production and closer tolerances are advantages claimed over conventional grinding. Here is how one motor maker adapted the process to its needs

ROTORS for electric motors can be ground concentrically within 0.0004-in. limits. Production time for small sizes can be 500 per cent better than that of conventional grinding methods. Add the plus of 60 per cent less equipment cost, and you have the advantages of a wet abrasive belt in a platen-type grinder.

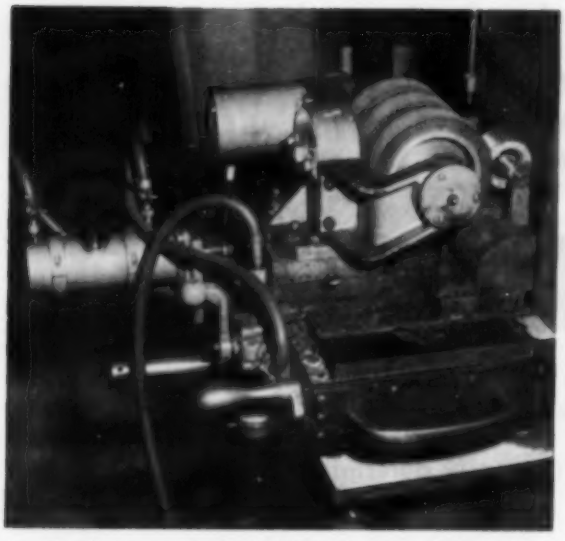
A pneumatic fixture mounted on a hydraulic in-feed which is automatic is the key. It was developed by Engelberg Huller Co., Syracuse, N. Y., to grind shaded pole rotors at the Olsen Machine & Tool Co., North Abington, Mass. Basically, it is adapted from a standard wet or dry abrasive belt surfacer.

Construction—A two-speed, hydraulic in-feed permits a rapid approach and a controlled cutting speed. A regulating wheelhead from an Engelberg centerless grinder was fitted with three 6-in. rubber wheels which revolve the rotors against the belt.

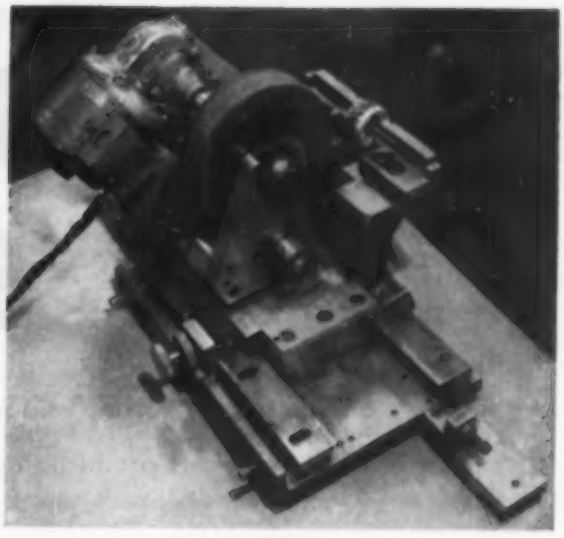
Rotors are loaded on a hardened steel arbor which fits into the holding fixture between the rubber wheels and the belt. A ½-in. carbide insert in the platen behind the belt insures uniform backing and increases platen life.

Designs—Olsen makes alternating current shaded pole rotors from ½ to more than 2½-in. in diameter. Rotors are made of copper and CR silicon steel laminated into stacks from ⅜ to 1½-in. thick. The machine is set to turn these at 12 rpm—larger diameters require an increase in the speed of the regulating wheels. A gear train on the regulating wheel drive can be conveniently changed.

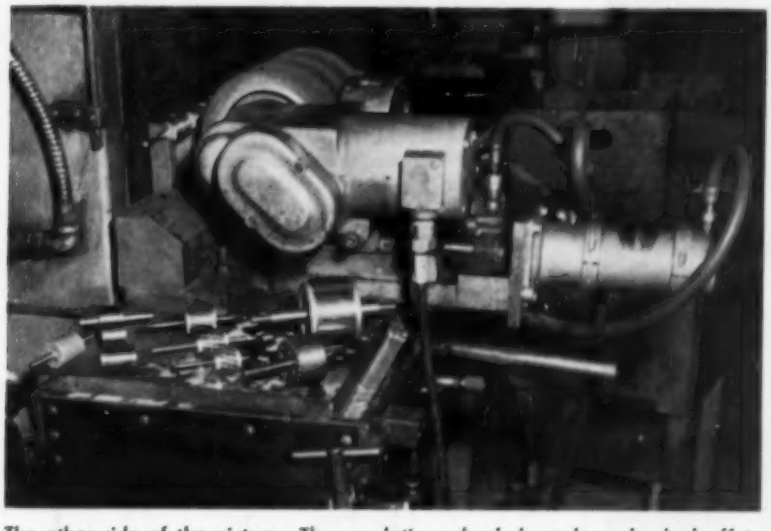
Operation — This is the finish grinding sequence: 1. Rotors are loaded on shafts in sets of 12 by a helper. The machine operator places them in the machine (one or more at a time, depending on stack width). 2. The air cylinder is tripped, moving the regulating wheels toward the work. A compensating spring with a double-action cylinder cushions the forward movement and provides a constant, uniform wheel pressure on the rotors. 3. The hydraulic in-feed is engaged, moving the work and regulating wheel fixture toward the belt. The feed is closely controlled. An air cylinder oscil-



An air cylinder and spring hold the three regulating wheels against the rotors. The entire table is moved to the wet belt hydraulically



If you'd like to test the method, here's the single rotor pilot fixture used by Engelberg engineers. Results led to the larger, multiple setups



The other side of the picture: The regulating wheels have been backed off to show the rotors in position. A variety of finished rotors is in the foreground

lates the work across the belt face. Oscillation is adjustable between ¾ and 5½-in. 4. When the dial indicator shows that grinding is complete, the operator trips the release and unloads the fixture.

A production cycle takes as little as 12 seconds. Finishing time does not differ between diecast or riveted types which are turned or trimmed to 0.005-in. oversize. Finish grinds are concentric between 0.0002 to 0.0004-in.; diameters are accurate to plus or minus 0.0005-in.

After finish grinding, the shafts are knurled, threaded and hydraulically pressed. The total indicator runout of the assembly is under 0.0005-in., well within the specifications for the production of small electric motor rotors.

Materials—The wet belt used by Olsen is a 40-grit aluminum oxide, which is 9 x 107 in. Compensation for belt wear is provided by table adjustment. Change time is 1 minute. Belt life is good: 12,000 rotors per belt. Used belts are serviceable for other operations.

Cure — Coolant applied to the work area and inside the belt prevents loading. Water soluble oil is used in a 40 to 1 mix.

Abrasive belts eliminate the need for fixing rotor shafts prior to finish grinding. With conventional methods, fixed shafts are absolutely necessary for locating purposes. Shafts limit the number of rotors that can be ground simultaneously.

With the wet belt method, the rotors are free to rotate on the arbor and as many as 12 rotors can be nested and finished at the same time. The method can be used for fixed shaft rotors also, but with reduced production rates.

Precautions — Preliminary tests at Olsen show that the rotors should be lathe turned or die trimmed within 0.010-in. Users must also keep in mind that closer tolerances need more grinding time: 0.0002 to 0.0004-in. specifications in the previous example require a 12-second cycle; 40 per cent more time is needed for 0.0001-in. tolerance.

The Engelberg equipment takes about half the floor space of a cylindrical grinder. Fixtures are more easily removed, increasing flexibility.

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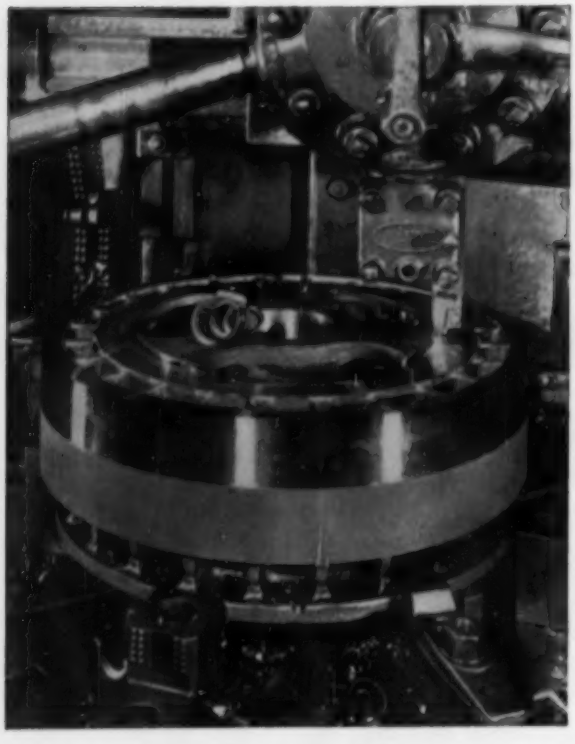
By using "Equivalent Grade" Charts when buying carbides...

YOU MAY LOSE THOUSANDS BY SAVING A FEW

Relying on "Equivalent Grade" Charts can lead to purchasing on low initial cost alone... whereas production ability really determines a tool's worth



TESTS ON 1045 CAST STEEL by a Chicago machine manufacturer demonstrate tremendous differences in carbides' production abilities. With Grade "X," as many as 16 clamp-on-type carbide inserts were required for a single facing cut on this power shovel clutch and brake drum.

A single Grade "Y" insert (Carboloy Grade 370) took nine cuts without showing any appreciable wear . . . under identical operating conditions. Result: over-all tooling cost reduced 90% on the 15-piece comparative run.

THE SO-CALLED "Equivalent Grade" Charts may be costing your plant literally thousands of dollars a year . . . in lost production, wasted manpower, higher machining expense.

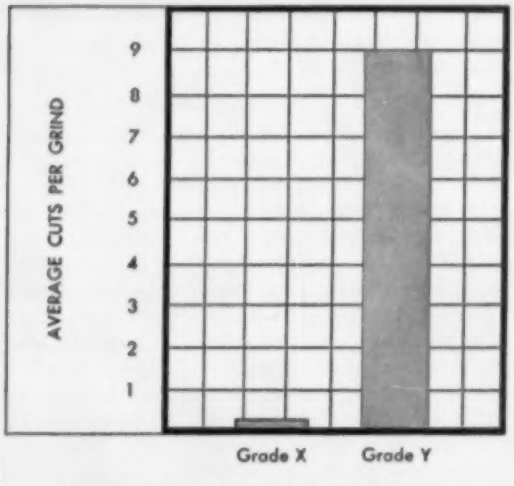
These charts conceal the tremendous differences in production abilities that always exist among various "equivalent" carbide grades. Worse, they tend to justify using initial cost, rather than over-all performance, as the basic criterion for purchasing carbide tools.

In-plant tests prove production abilities vary

What will happen to production if carbides are selected on the basis of the "Equivalent Grade" Charts? The case history at left gives the answer. It is typical of hundreds in the Carboloy files.

The average "Equivalent Grade" Chart lists no fewer than 14 different grades for this job . . . and implies that they can be used interchangeably. But in-plant comparative tests proved that no two grades could provide the same results.

When Grade "X" was selected, for example, an average of four inserts were required to take a single facing cut. But when Grade "Y" was used, a single carbide insert produced nine cuts . . . a tool life increase of 36 to 1 (Graph No. 1).



Graph No. 1—Production Ability Comparisons

OF PRODUCTION DOLLARS TOOLING PENNIES

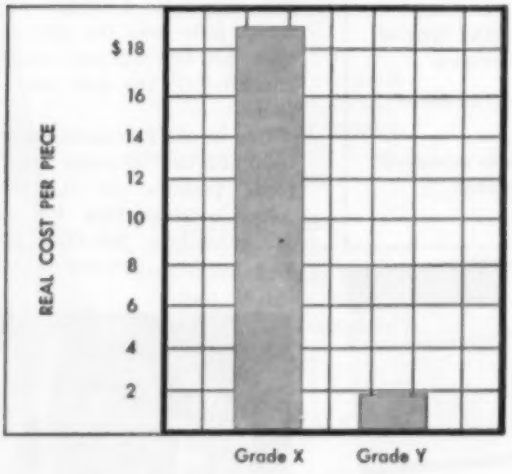
Why the tremendous difference? Grade "Y" simply had more production ability. It brought far more production per grind, reduced downtime, and drastically lowered grinding costs. Yet nothing in the "Equivalent Grade" Charts could predict this.

Initial Costs vs. Real Costs

Because "Equivalent Grade" Charts imply that all grades perform alike, they make it logical to assume that low initial cost is the most important consideration. A little arithmetic will prove that the *real* cost of carbides bears no relation to initial cost.

With Grade "X," total tooling cost for 15 pieces was $285.68 (16 tools at $13.04 each; 44 regrinds at $.41 each; 59 tool changes at $1.00 each). Machining cost per piece was $19.05.

Grade "Y" inserts cost $1.30 more initially. But total cost for 15 pieces was just $29.68 (2 tools at $14.34 each; 1 tool change at $1.00; nothing for regrinds). Real cost per piece with Grade "Y" was $1.98 . . . a reduction of 90%!



Graph No. 2—Real Cost Comparisons

Now add to these savings in tool cost, downtime, and grinding charges, the equally important savings from lower total manpower costs and reduced inventories. Then multiply the total by the number of jobs in the plant where similar cost reductions can be realized. You'll see why a few pennies more per tool is a small price to pay for carbides that can save you so much.

Cost-conscious purchasers specify Carboloy Extra-Performance Carbides

Grade "Y" in the preceding example is Carboloy Grade 370. It is one of three new, extra-performance steel-cutting carbides. These three grades – 330, 350, and 370 – cost slightly more initially because they are made by a unique and more costly process. But their performance is so superior to conventional carbides that there is no classification on the "Equivalent Grade" Charts to fit them.

Because of their extra production ability, these carbides easily show up the glaring shortcomings of the "Equivalent Grade" Charts. But even on conventional grades, actual tool comparisons prove the charts cannot be relied upon.

That's why we make this suggestion: Have comparative tests run in your own plant, on your own jobs. When the results are in, you too may find that your plant can save thousands of dollars a year simply by switching to carbides with greater production abilities.

With so much money at stake on every carbide tool used in your plant, you can easily see why the phrase "or equivalent" is rapidly becoming obsolete on tool specifications. These tests prove it really pays to specify *Carboloy* cemented carbides – by name.

If you would like a more detailed discussion of the whole subject of Initial Costs vs. Real Costs, and the fallacies of the so-called "Equivalent Grade" Charts, write today for a Carbide Sales Engineer to call on you. *Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Street, Detroit 32, Michigan.*

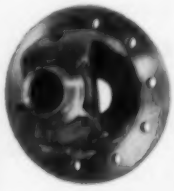
"Carboloy" is a trademark of General Electric Company

CARBOLOY

CEMENTED CARBIDES

How about Malleable ?

...Don't overlook the advantages of this highly versatile material!



STANDARD malleable iron is a strong cast ferrous alloy having a remarkable combination of properties:

- ✔ Toughness and ductility
- ✔ Excellent machinability
- ✔ High impact resistance
- ✔ Resists corrosion

...and how about Pearlitic Malleable?

PEARLITIC malleable iron is a special type of malleable having these unique characteristics:

- ✔ Exceptional bearing properties
- ✔ Easily machined
- ✔ High yield strength—45,000 to 80,000 psi.
- ✔ Can be selectively hardened

Whether you are designing new products or reviewing present production—keep *Malleable* in mind. Design and application data to help you design with malleable is available, free, from Malleable Founders' Society. Write for Malleable Iron Facts, No. 46.

1800 Union Commerce Building Cleveland 14, Ohio

Machining Time Cut

Computer lops 78 minutes off time required to machine expanding shell for arbor

BY OLD machining standards, it would take 244 minutes to machine an expanding shell for an arbor in the Chicago plant of Scully-Jones & Co.

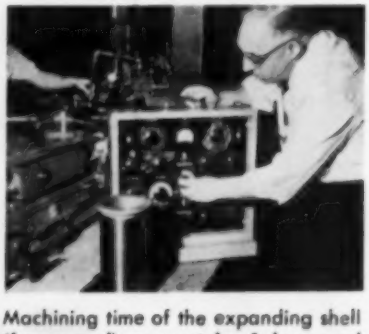
With new standards furnished by a Carboloy machinability computer, the company is machining the part in 166.20 minutes. That is a saving of about 17 hours on 13 parts.

Benefits — Besides increasing production on short-run jobs, the company also is correcting or verifying working standards, establishing standards quickly on new jobs and educating machine operators on proper machining practice.

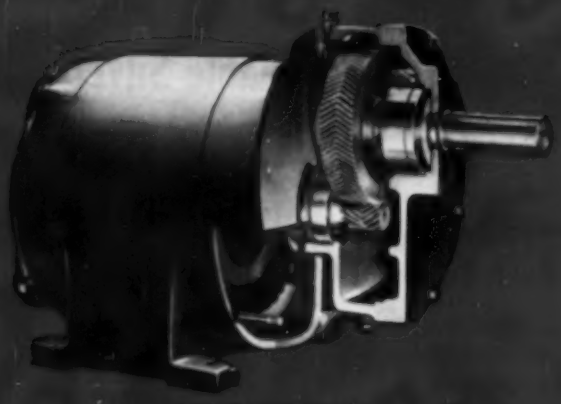
The computer allows the plant more flexibility in the use of its machines. The expanding shells of the company's Roll Lock arbor are machined from a solid upset forging because of structural requirements.

Standard—The job could be machined more economically on a saddle type turret lathe with more horsepower and proper tooling. But since a No. 5 Gisholt ram type turret lathe was the only machine open, and the job had to be started immediately, the nod went to the Gisholt.

Use of the computer quickly determined the optimum speeds and feeds possible on the machine. After compensating for variable job conditions, the final standard was quickly determined.



Machining time of the expanding shell (foreground) was cut by 1 hour and 17.8 minutes through new standards established by the Carboloy machinability computer



SINGLE REDUCTION
Parallel Shaft Type

MASTER -1st Choice for GEARMOTORS

Because...

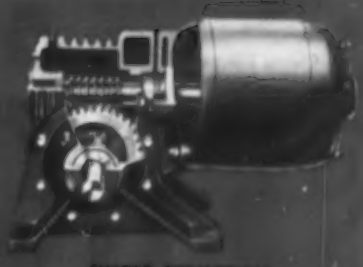
...With five types of parallel and right angle Gearmotors, Master has the flexibility and choice of design you need for selected output speeds.

...With electric motor and gears combined into a compact, integral power unit, you reduce costs and increase efficiency through elimination of belts, couplings, chains, sprockets, external bearings or separate reducers.

...Available in sizes from 1/8 to 125 H.P. You can integrate with the gearmotor electric brakes—3 types of variable speed units and fluid drive in any combination.

...And that's why more gearmotors carry the Master name than all other makes combined. Write on your business letterhead for details.

DOUBLE REDUCTION
Parallel Shaft Type



SINGLE REDUCTION
Right Angle Shaft Type

THE MASTER ELECTRIC COMPANY

Dayton 1, Ohio

RANSBURG
Electro-Spray
DOES IT BETTER... FOR LESS

Look what Ransburg Electrostatic Spray painting is doing in this eastern job shop, the Del-Val Finishers Division of J. W. Rex Company, Lansdale, Pa.

As a job shop, Del-Val handles a variety of work each month, painting hundreds of thousands of pieces and parts of various sizes and shapes.

The versatility and flexibility of Ransburg Electro-Spray makes it ideal for their varied painting requirements. Here's a typical example. Del-Val recently completed a contract for a Philadelphia manufacturer of barbecue trays with these results:

50% INCREASE IN PRODUCTION

50% SAVINGS IN LABOR and OVERHEAD

66% CUT IN PAINT COSTS, with improved, more uniform, and higher quality finish.

The job—flat sheet steel, 11" x 19"—enamel coated to withstand a 90 bend with sharp radius. Full coat one side; mist coat other.

WITH RANSBURG ELECTRO-SPRAY		BY FORMER HAND SPRAY	
Output, 375 panels per hour with 3 men		Output, 250 panels per hour with 4 men	
	per panel		per panel
Labor and overhead	.06	Labor and overhead	.12
Paint & lease cost	.017	Paint cost	.044
TOTAL COST	.077	TOTAL COST	.164

Want to know what Ransburg Electro-Spray can do for you in YOUR finishing department? Write for our new No. 2 Process brochure. It tells the WHAT & HOW of electrostatic spray painting, and with numerous production-line examples, shows how other manufacturers are cutting finishing costs ... increasing production, and improving the quality of their work with Ransburg equipment. Too, we have available now a new movie, "The Big Attraction," a 27-minute sound and color film on electrostatic spray painting.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

Hardenable Silver

New silver alloy retains high conductivity and hardness at elevated temperatures

A NEW silver-magnesium-nickel alloy can be worked easily while soft, then irreversibly hardened by heating in air.

Developed by Handy & Harman, New York, the alloy, once hardened, is highly resistant to softening, has a low creep rate, and for practical purposes does not anneal at elevated temperatures.

Properties — In the as-received (annealed) condition, the silver alloy can be formed by stamping, drawing, bending, spinning, etc., usually without anneals.

If annealing is necessary, it can be done in 15 to 30 minutes in air at 700°F or in a nonoxidizing atmosphere above 700°F. Permanent oxidation hardening is done at 1200 to 1475°F, the time and temperature cycle depending on the thickness of the piece.

Uses—Typical suggested applications for silver-magnesium-nickel alloys are electrical contacts which can be brazed without loss of hardness; shields and clips for miniature vacuum tubes; instrument and relay springs, contact arms, wipers and sliders which require high conductivity and hardness at elevated temperatures.

In the oxidation-hardened condition, the tensile properties of the alloy at room temperature are similar to those of hard rolled coin or sterling silver. At elevated temperatures, hot hardness and strength are considerably better than that of hard-rolled silver-copper alloys.

Ductility—At elevated temperatures, hardness and strength are accompanied by lower ductility; the material tends to fracture rather than creep at excessive stresses. Parts should be designed to avoid high stresses.

Hardened parts of the Ag-Mg-Ni alloy can be brazed in air with any of the Easy-Flow silver brazing alloys and an active paste flux; it also can be soft soldered. Corrosion resistance is similar to that of fine silver; resistance to salt corrosion is excellent, since the alloy contains no copper.

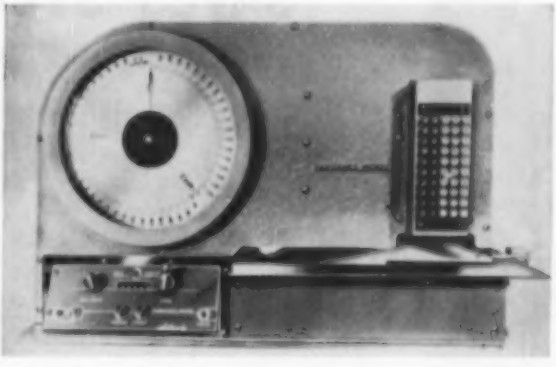
Electronic Scales Weigh Faster and Simplify Data Processing

Weighing operations are streamlined with weighing instruments in this line.

Weight recording instruments may be 250 ft from the scale platform. A printer has selective print and weigh buttons.

Other features: Automatic balance detection, hold or memory circuit, automatic ranging zero balance knob and a net-gross switch.

Two basic types of scales are available: The full electronic (load cells replace the conventional lever system) and the Levetronic (the lever system is used with a load cell hooked in tension in the steelyard rod). *Write*: Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill. *Phone*: Harrison 7-7100



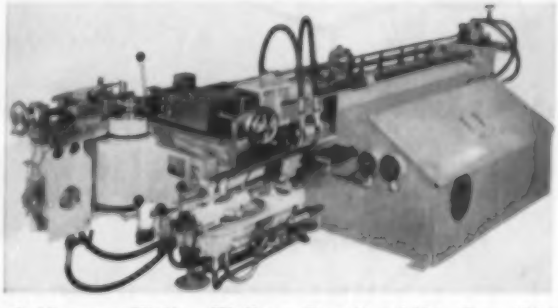
Tube Bending Machine Does Production Work

An inexperienced helper can operate this machine. The foreman bends a tube. As the bends are made, each one is recorded on a process bending card from settings on dials. The helper can take the card and in 15 minutes set up a machine to duplicate the original bent tube.

Measuring devices are not needed to set up the machine. Micrometer positioning dials for the pressure die, clamping die and shoe are built into it.

Degree of bend is selected from the degree dial. Length gages are set from a length scale mounted on the machine. A protractor is built into it for rotation of planes between bends.

The hydraulic, rotary type machine bends aircraft work automatically. Bending arms run at a maximum of 15 rpm. *Write*: Wallace Supplies Mfg. Co., 1304 Diversey Pkwy., Chicago 14, Ill. *Phone*: Buckingham 1-7000



Sliding Bed on Lathe Doubles Swing Size

With the bed closed, this 16-in. machine functions as a regular engine lathe. With the bed extended, the lathe has twice the normal swing size and 50 per cent greater distance between centers.

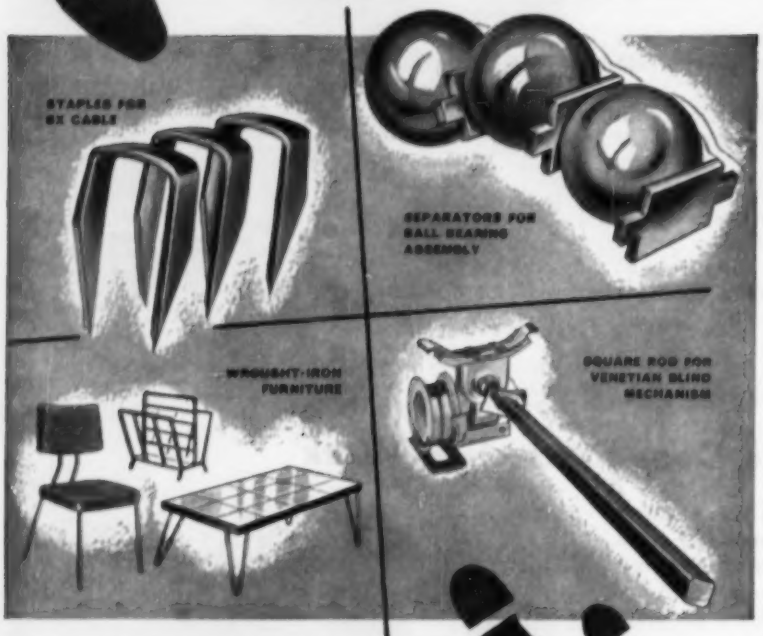
This versatility makes it ideal for turning the unpredictable extremes encountered in maintenance and job shop work.

The lathe can face 38-in. diameters in one cut. In two cuts, it can face 45-in. diameters.

With an optional extension rest, it can turn 27¼-in. diameters, 13¼-in. long. The optional full-swing turning attachment makes it possible to turn a 45-in. diameter almost the full length of the gap.

Speed range: 8 to 2000 rpm. The quick change gearbox is totally enclosed. Ways are hardened and ground. *Write*: R. K. LeBlond Machine Tool Co., Madison & Edwards Ave., Cincinnati 8, O. *Phone*: Jefferson 1-0910

CONTINENTAL® FLAT & SHAPED WIRE SAVES STEPS


STAPLES FOR BX CABLE
SEPARATORS FOR BALL BEARING ASSEMBLY
WROUGHT-IRON FURNITURE
SQUARE ROD FOR VENETIAN BLIND MECHANISM

...cuts corners in production

● STANDARD AND SPECIAL SHAPES IN MANY SIZES

Shaped wire often saves steps by eliminating forging, stamping, and rolling operations—giving you a ready-made molding, product trim, or component that requires a minimum of further fabrication. Saves metal, too. From Continental you can obtain many cost-cutting wire shapes—V-shaped, oval, square, rectangular, triangular, keystone-shaped, and others.

● IN A WIDE RANGE OF TEMPERS AND FINISHES

Practically any temper, finish, or analysis in low carbon and medium low carbon steels can be specified to give you the *right* wire for the job—including #3 finish wire for electroplating.

● PRECISE MANUFACTURING CONTROL

Continental Special Shaped Wire is made under strict quality control to assure uniformity. You get a better product and fewer rejects—qualities that Continental wire customers especially appreciate. Let us help *you* save production steps, too. Write for the complete story of Continental wire today.

Wire Specialists for over Half a Century

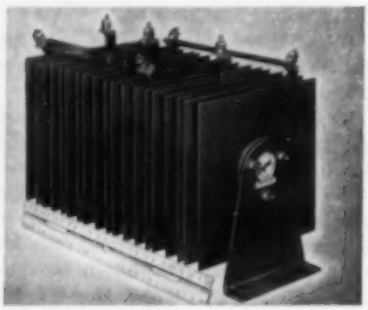
CONTINENTAL STEEL CORPORATION · KOKOMO, INDIANA

PRODUCERS OF Manufacturers' Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. Also, Coated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

NEW PRODUCTS and equipment

Silicon Rectifier

The silicon rectifier is for high power direct current requirements where only alternating current is available.



The unit will rectify 20 kw of alternating current power with an efficiency exceeding 98 per cent. It weighs only 5 lb and occupies one-quarter of a cubic foot. The unit is rated at 100 amperes, 200 volts. *Write*: Bogue Electric Mfg. Co., 52 Iowa Ave., Paterson 3, N. J. *Phone*: Lambert 5-2200

Sand Binder

A silicate-based sand binder is for the production of cores and molds without baking. It has no separation in storage, low viscosity, good bench life, superior gas reaction, good storage life and good collapsibility.

The binder is packaged in 5 and 55 gal drums. *Write*: Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, O. *Phone*: Main 1-6100

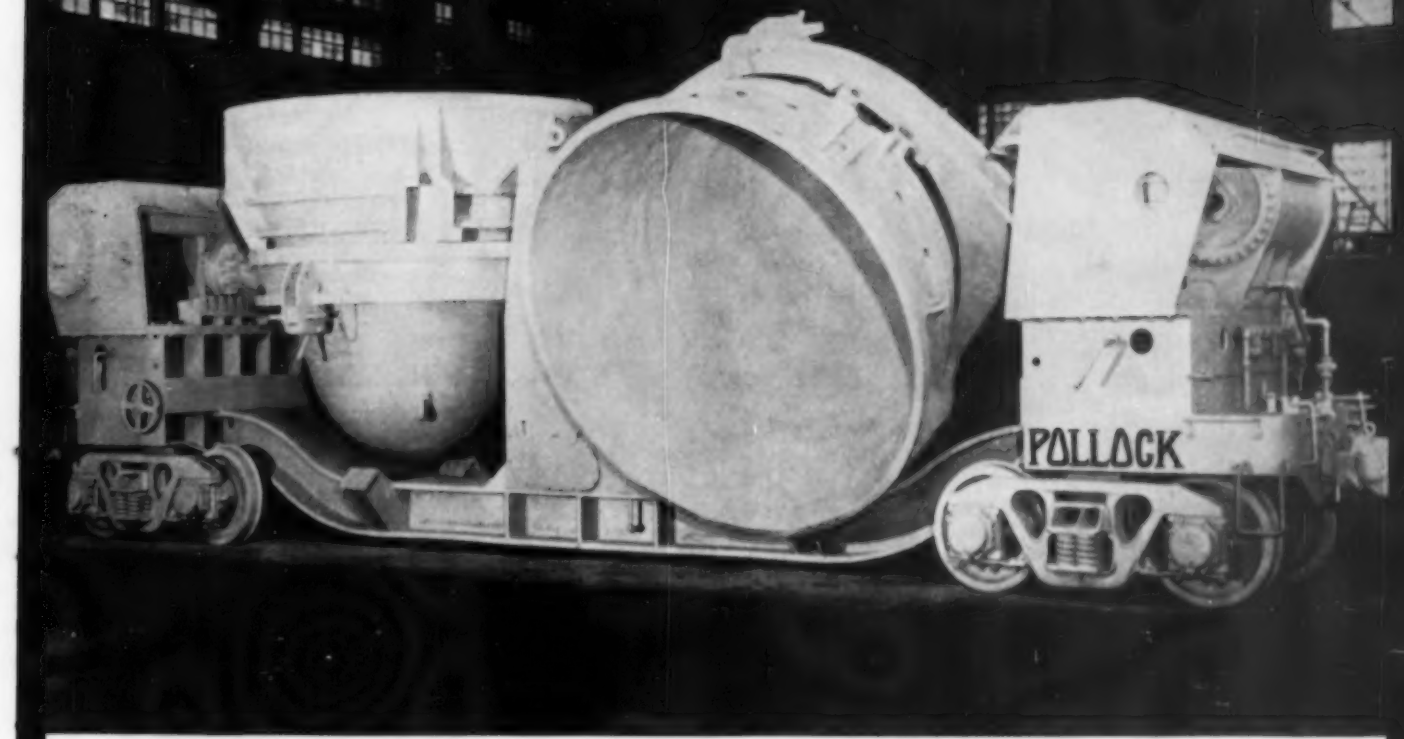
Cemented Carbides

Firlomet cemented carbides include lathe centering blanks, roll turning and milling cutter blades and solid cylinders.

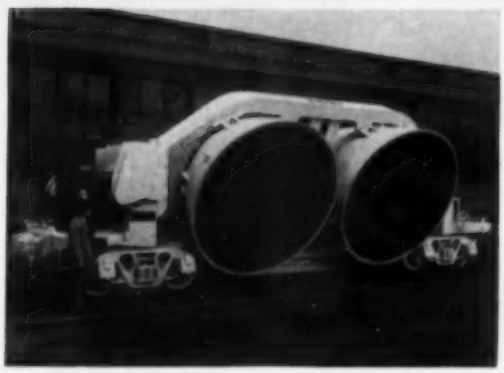
The lathe center blanks are carried in seven sizes ranging from ¼-in. diam x 7/16-in. long to ⅞-in. diam x 1⅜-in. long. These centerless ground blanks are suited for general machining and wear-resistant applications.

Roll turning blanks are ground on all surfaces and have rounded corners. Seven sizes are available.

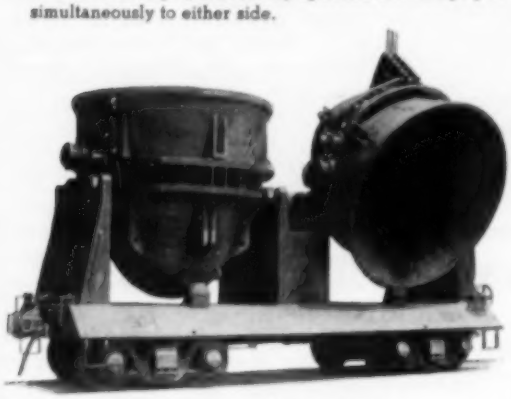
The six sizes of solid milling



Double pot, air operated Pollock slag car dumps to either side. Pots dump separately or together.



Pollock double pot, electrically operated car dumps pots simultaneously to either side.



Double pot, crane dumped slag car.

ONE OF THESE
DOUBLE POT SLAG CARS
IS RIGHT FOR YOU
DO YOU KNOW WHICH IT IS?

The type and size slag car you can use most efficiently and economically depends on three things: existing facilities, clearances and the use of the car. If you process slag, an electric dump gives you slow, even distribution. If you have a railroad crane or crane at the dump you can use the crane type. If you have adequate air capacity you will want the air operated cars, because they furnish the best means of dislodging skulls. The best way to select the proper car for your use is to consult the experts at The William B. Pollock Company. Most steel producers do. Pollock has built more slag cars, of all types, than anyone else in the world.

THE WILLIAM B. POLLOCK COMPANY
Since 1863

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ENGINEERS • FABRICATORS • ERECTORS • STEEL PLATE CONSTRUCTION

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

IN CRANE SERVICE...

DEPENDABILITY MEANS EVERYTHING

Everything in "Shaw-Box" Cranes is designed and built to assure complete dependability in the severest services. Industrial plants of every size and description acknowledge the outstanding performance of "Shaw-Box" Cranes. For these rugged cranes have construction and operational advantages that keep power consumption and maintenance costs low — features that completely safeguard man, load and crane.

"Shaw-Box" creative engineering has been responsible for developing many new concepts in overhead cranes that are now recognized as standard in specifications all over the world. Out of this continuing research are coming even greater advances to keep pace with the needs of industry in the years ahead.

Whether your plant requires a small heavy-duty crane or one whose capacity is 300 tons or more, you can be sure of plus value for every dollar you invest in a "Shaw-Box" Crane. We manufacture the most complete line available anywhere and will gladly help you select the type and size that will assure the utmost in dependability and economy. *Write for Catalog 219.*

"Shaw-Box" CRANES

MANNING, MAXWELL & MOORE, INC.

MUSKEGON, MICHIGAN

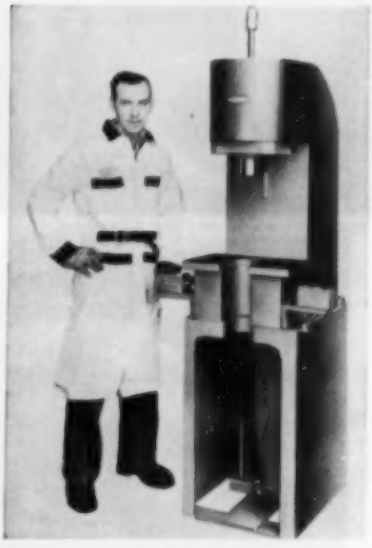
Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Makers of 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

NEW PRODUCTS and equipment

cutter blades come in three grades. Solid carbide cylinders are stocked in 16 sizes and four grades for a wide variety of machining and boring applications. *Write*: Firth-Loach Metals Inc., Buttermilk Hollow Rd., McKeesport, Pa.

Air Hydraulic Press

The C-500 press has a rated capacity of 15 tons. Three types of controls are offered—dual hand, foot pedal and fully automatic.



The standard model has an 8¼-in. throat and delivers a 6-in. stroke at 10 cycles a minute. Other throat and stroke sizes are available. *Write*: Air-Hydraulics Inc., 239 Belden St., Jackson, Mich. *Phone*: State 2-7956

Resin Adhesive

EC-1386 is a one-part epoxy resin adhesive that provides high shear strengths without the necessity of adding an accelerator or catalyst.

This liquid adhesive is for metal bonding over a service temperature range of −65 to +250°F. It gives good adhesion to braas and steel as well as aluminum. No volatile by-product is given off during the curing cycle which makes it particularly useful for bonding impervious surfaces.

Shear strengths over 4600 psi

Let our experience help you

For more than forty years manufacturers in every industry have availed themselves of Bohn's technical skill and fabrication know-how. The benefits of Bohn's wide experience in extrusions, castings and forgings and other fabricated products are available to you. Let us quote on your specifications. Send us your blueprints today!

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DETROIT 26, MICHIGAN

SALES OFFICES:

BRASS ROD • BRASS AND BRONZE INGOTS • PISTONS • BEARINGS • FORGINGS • EXTRUSIONS • CASTINGS • REFRIGERATION AND AIR CONDITIONING PRODUCTS

are obtained. *Write*: Adhesives & Coatings Division, Minnesota Mining & Mfg. Co., 423 Piquette Ave., Detroit 2, Mich. *Phone*: Trinity 5-7111

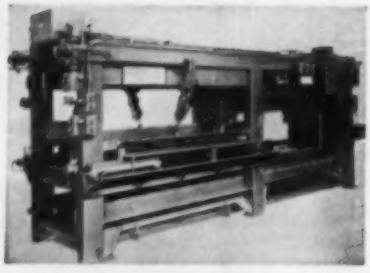
Strip Mill Welders

Multi-spot welders join the ends of steel stock in continuous strip mill operations. The units weld the tailing end of strips up to 80 in. wide to the leading edge of the next strip.

The traveling C-frame carries mill-type welding guns above and below the strip. The operator has full control over spot spacing. Guns weld in either direction of the carriage travel.

High-quality welds made by the unit will withstand the high tension needed to pull strips through the mill operations.

While strip is running, test welds can be made and gun or welding tip maintenance performed.



All machine operating variables —weld sequence timing, weld heat, electrode pressure, clamping pressures and index spacing—can be adjusted from the operator's position. *Write*: Resistance Welder Corp., Bay City, Mich. *Phone*: 2-1506

Brass Slab Milling

Here are milling cutters that eliminate the longitudinal ridges previously produced when milling the scale from partially worked brass slabs before final rolling.

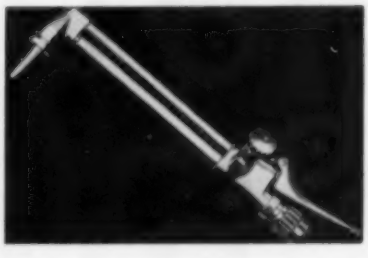
The cutters contain six rows of blades in a special construction which permits uniform absorption of wedge pressures, minimizes strain and blade breakage. Heavy peripheral cuts are possible since the cutting edge is on a helix. A coarse pitch eliminates heat.

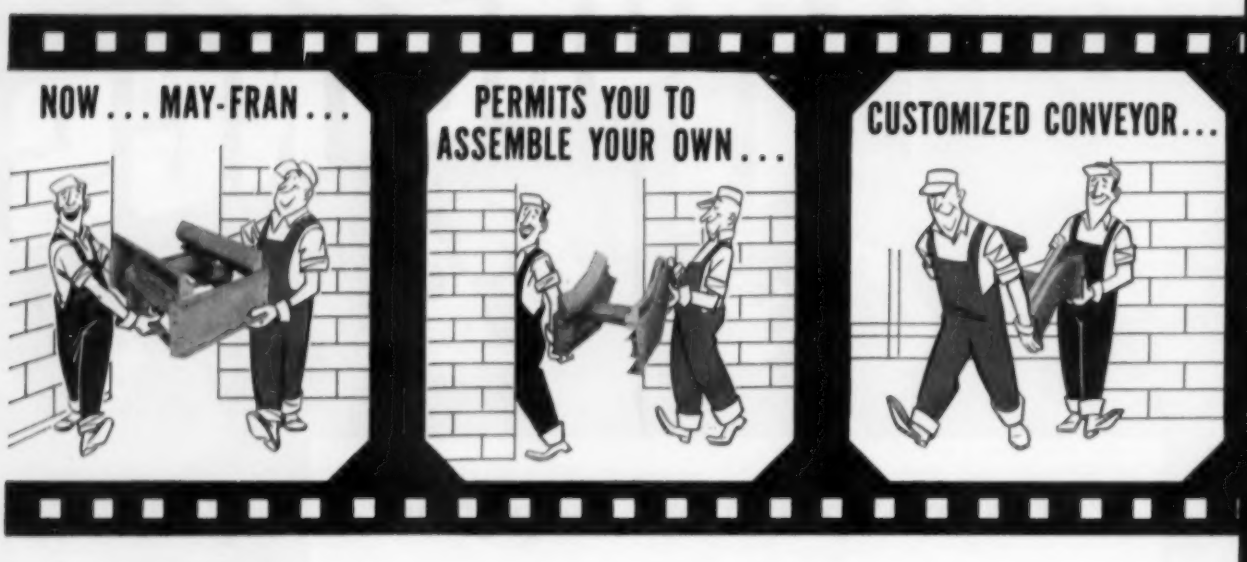
On test runs in brass, the cutters operated at 1500 rpm with a 50 fpm feed. *Write*: Goddard & Goddard Co., Detroit 23, Mich. *Phone*: Kenwood 1-3000

Cutting Torch

Prest-O-Weld CW-120 is for intermittent cutting on aircraft, auto bodies, fenders and other light sheet and plate.

Cutting nozzles come in three sizes for general purpose cutting ranging from 1/16-in. sheet to plate 2 in. thick. Weight of the unit with the largest size cutting nozzle





Whether you give first consideration to cost . . . or to the overall efficiency of an installation . . . the MAY-FRAN CONVEYOR STANDARDIZATION PROGRAM provides benefits never before possible.

Through STANDARDIZATION, you now can build your own CUSTOMIZED conveyor to meet your own individual needs. The MAY-FRAN components . . . mass produced . . . can be assembled into virtually any type of hinged-steel conveyor for the handling of stampings, formed metal parts, forgings, automotive scrap, chips and turnings.

Straight sections . . . concave or convex sections . . . take-up and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

These pre-fabricated units are available rapidly and at low-cost. You save money many ways with MAY-FRAN standardization because . . . conveyors can be assembled by your own plant personnel . . . conveyors can be modified in any way when production needs change . . . conveyors can be dis-assembled and moved to other plant locations.

is only 13½-ounces.

Quick-sealing, gas-tight synthetic rubber O-rings eliminate metal-to-metal gas seal maintenance. *Write*: Linde Air Products Co., division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 7-8000

Multiple Drilling

The combination swivel and air counterbalance attachment makes it possible to adapt large multiple-spindle drill and tapping heads to radial drilling machines.

Two cylinders are used to maintain a balanced condition of the head on the machine. Air in the counterbalancing setup is controlled on both ends of the stroke to counterbalance the weight of the head. On the return stroke, the air is controlled to prevent quick return of the head.

The attachment incorporates a 360-degree swivel to give proper alignment of the entire drill head. The unit is suited for drilling con-

denser plates, boiler tube sheets, flue sheets, etc. *Write*: U. S. Drill Head Co., 616 Burns St., Cincinnati, O. *Phone*: Grandview 1-5250

Industrial Adhesives

Ray-Bond is a line of adhesives for bonding and lamination operations. These thermosetting adhesives offer excellent bonding qualities and heat stability. They resist temperature extremes ranging from −80 to +700°F.

The adhesives can be used for bonding, coating or sealing of wood, metal, plastics, glass, ceramics, friction material compounds, leather, paper, insulation materials, rubber and cork.

Resistance to most oils, solvents, gas and water is offered by the adhesives. *Write*: Special Products Department, Raybestos-Manhattan Inc., Bridgeport, Conn. *Phone*: Edison 7-3341

Hydraulic Press Brake

Up to seven different angles can be formed in succession without resetting the controls on this brake. All bends are formed in one handling by presetting the controls just once.

The range of the machine is from 12-in. deep bends formed in a single stroke to bends of less than ⅛-in. with press cycling at 50 strokes a minute or more.

Parts can be passed from die to die for blanking, deep drawing.

For complete information, write today for your copy of MF-Bulletin 200

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In addition, Cannon-Muskegon offers a wide range of ferrous-, nickel- and cobalt-base alloys for your specific needs. These super-clean alloys are poured at pressures from 1 to 10 microns — available in sample or production quantities . . . in cast billets or ingots. Vacuum-melted alloys offer cleaner, smoother surfaces . . . greater tensile strength, ductility and wear life . . . higher electrical and magnetic properties. For complete vacuum-melting service, see Cannon-Muskegon.

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- ***Materials for remelt*** — under conventional air melting, inert gas, vacuum.
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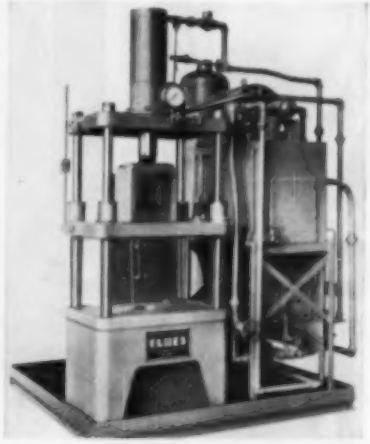
embossing, punching and forming. Other uses: Straightening, rubber pad forming, pipe making, stretching, extruding, hot forming and shearing heavy plates. *Write*: Pacific Industrial Mfg. Co., 848 49th Ave., Oakland 1, Calif. *Phone*: Andover 1-8303

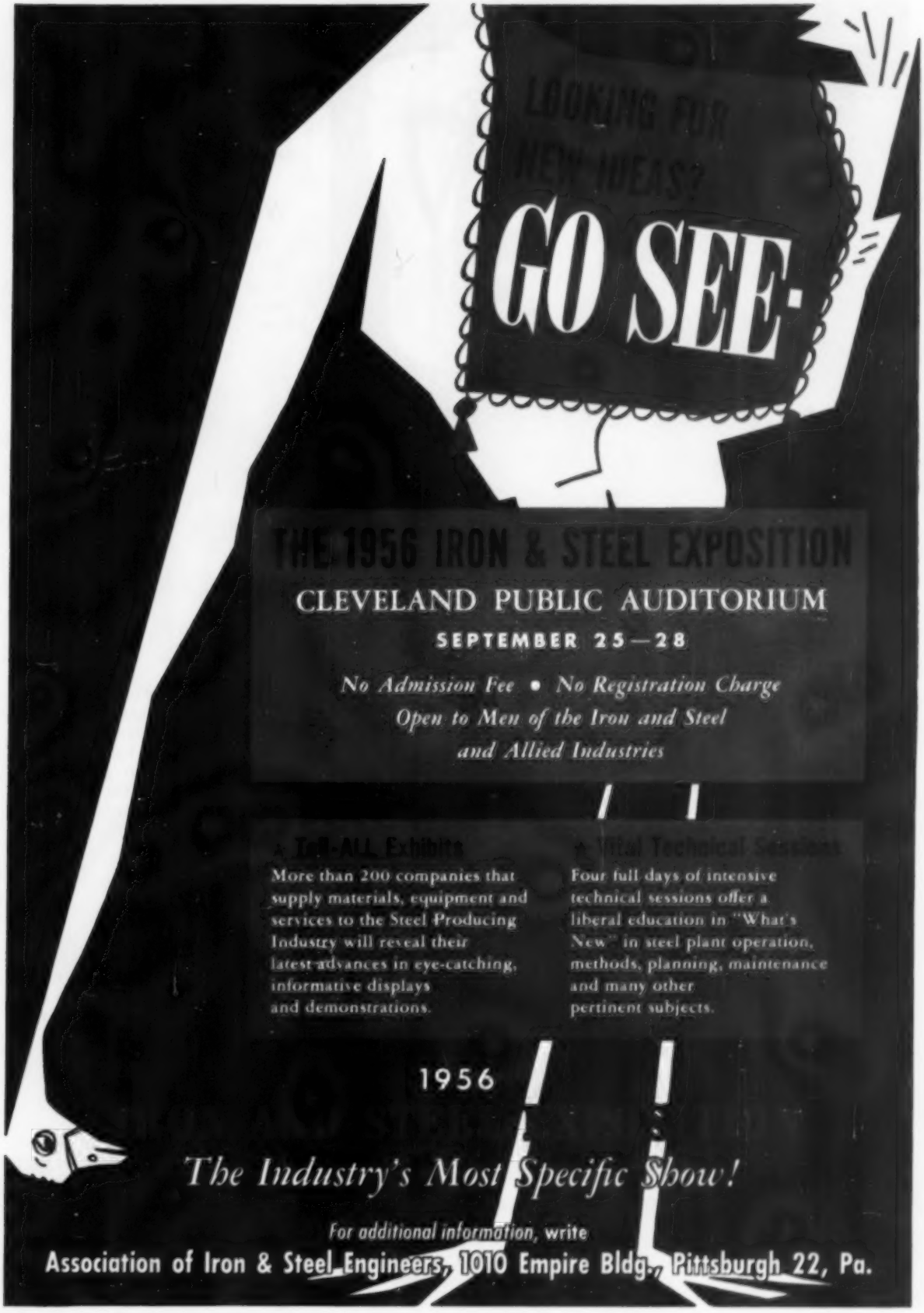
Diecasting Press

This accumulator-operated unit is for casting motor rotors by dunking into a pool of molten aluminum.

Using the customer's tooling, the operator ladles in the molten aluminum and closes the safety door which starts the press cycle. Both loading and unloading are automatic.



The press platen is guided closely and held parallel throughout the stroke by four columns. An accumulator system gives full pressing force at top speed immediately at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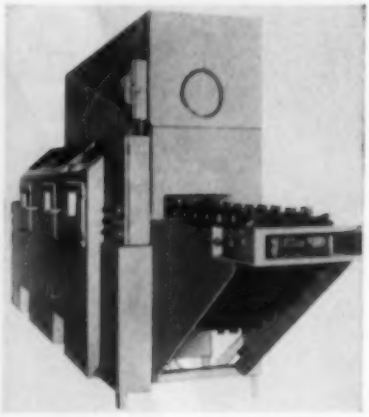
NEW PRODUCTS and equipment

contact with the molten aluminum. *Write*: Elmes Engineering Division, American Steel Foundries, 1150-X Tennessee Ave., Cincinnati 29, O. *Phone*: Redwood 1-9210

Wet Blasting

This automatic pressure blast unit gives a decorative satin finish to the highly polished flat aluminum sheet used in home appliance trim.

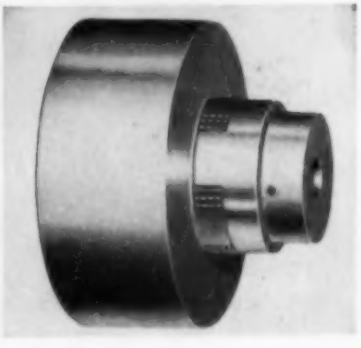


Parts are blasted uniformly by a cluster of traversing guns. Rinsing and drying are automatic. Custom molded work holding devices handle parts up to 20 in. wide. *Write*: Cro-Plate Co. Inc., 747 Windsor St., Hartford 1, Conn. *Phone*: Jackson 7-8273

Flexible Coupling

A space-saving drive arrangement is provided by this coupling which incorporates a brake drum flange on the outside diameter.

The coupling comes in eight sizes with horsepower ratings from



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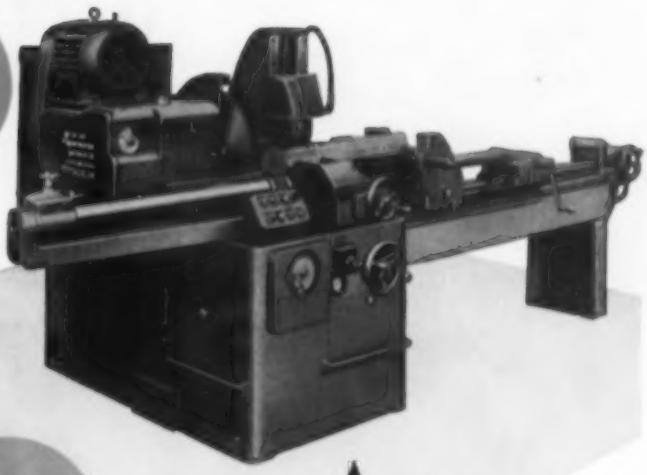
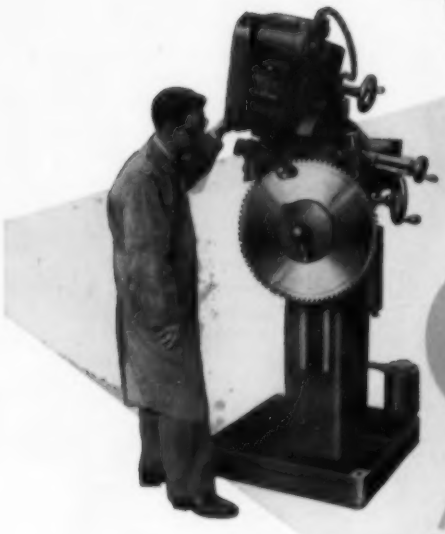


The No. 2-8 machine for cutting off solid metal up to 8" square.

SAW BLADE SHARPENERS



The G-45 sharpener for blades 8" through 48" diameter.

SAW BLADES

M. & M. saw blades cut any machinable metal. Cut-off blades: segmental — 11" through 120" diameter; solid — 8" through 20" diameter. Slitting saws — 3" through 8" diameter.

You may profit immensely by applying the M. & M. Triple Threat to *your* cut-off costs. Machine, blade, and grinder, made by the first company to build all 3, often effect phenomenal savings, as proved by detailed case studies. *Just such a study of your job is yours for the asking.* We offer you an unmatched experience in the sawing of any machinable metal, round, square or structural shapes, from 1/4" through 43" diameter.

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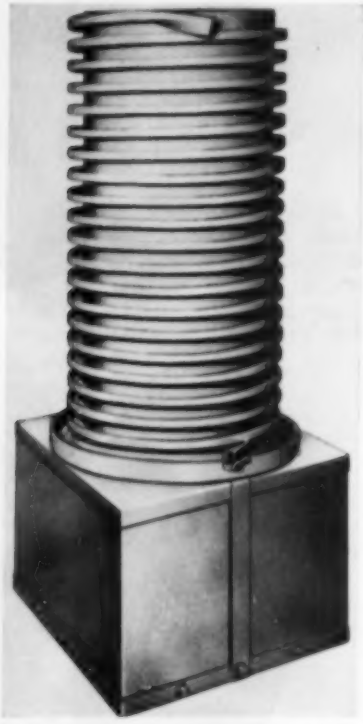
2 to 40 at 1750 rpm. Maximum bores of the hub body range from 1 to 2½-in.

Drum body bores are made to motor shaft sizes. Distances between shafts range from ½ to 1⅝-in. *Write:* Department SLC, Lovejoy Flexible Coupling Co., 4801 W. Lake St., Chicago 44, Ill. *Phone:* Estebrook 9-3010

Parts Feeder

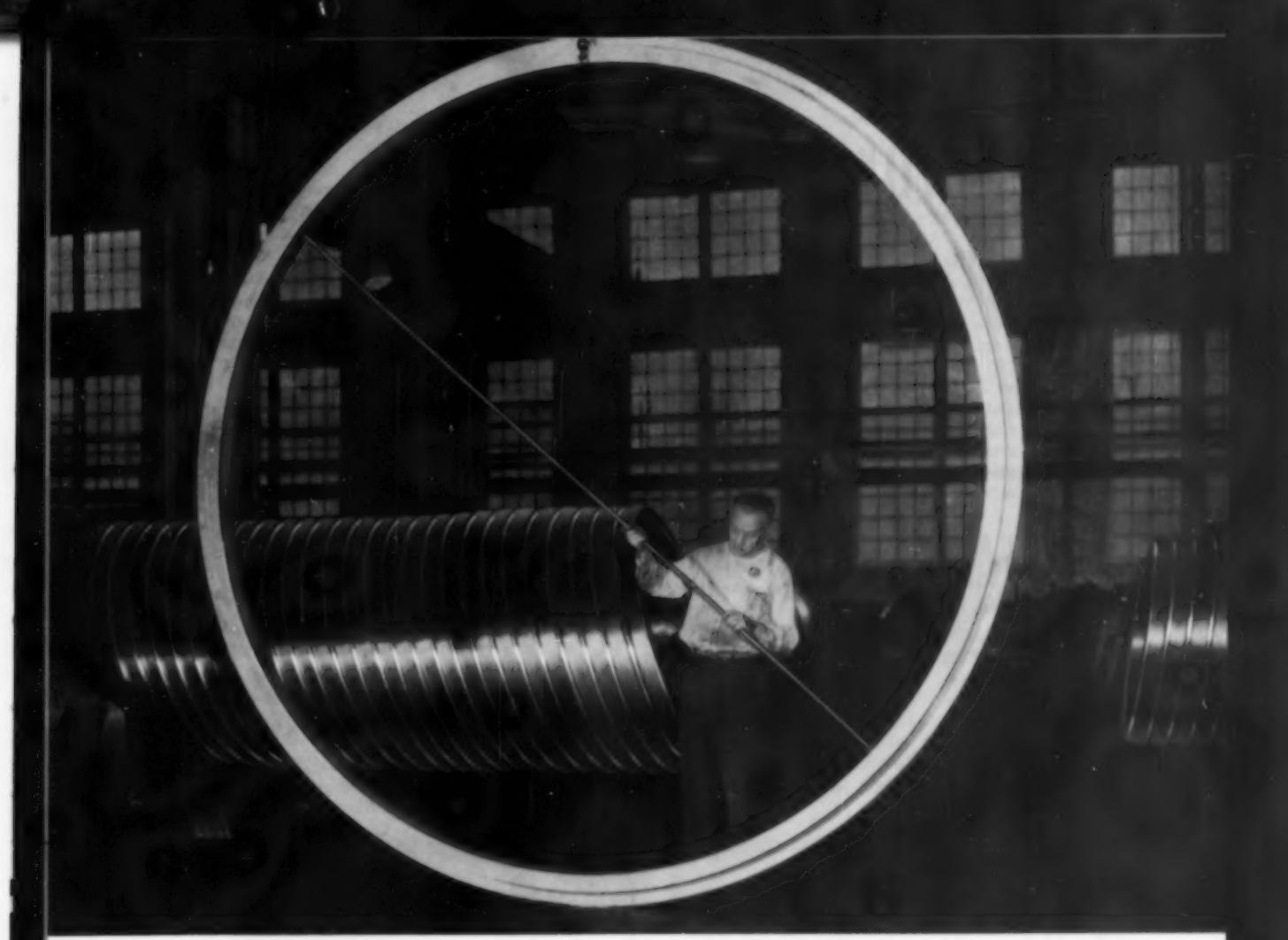
The transfer and storage parts feeder eliminates manual handling of small parts between operations in production and processing lines.

The unit receives and discharges parts at required levels. It provides storage space for parts between operations and orients them before discharge.



The feeder is equipped with an electromagnetic drive on which is mounted a spiral. Electromagnetic vibrations (regulated by a rheostat on a separate control unit) convey parts up and down.

Maximum part lengths of ¼ to 5 in. are handled by six models. *Write:* Syntron Co., 370 Lexington Ave., Homer City, Pa.



you can improve your product, cut costs with Standard Steel forged rings and flanges

Here's why you can be sure of a *quality* product when you specify Standard Steel rings and flanges:

- We produce our own acid open hearth steel, quality-controlling it every step of the way.
- Our rolling practice reflects 60 years of experience. Controlled cooling and subsequent heat treatment assure long service life.
- Finished rings and flanges are carefully inspected to make certain they meet your specifications exactly.

When you specify Standard Steel rings and flanges you cut costs because:

- First costs are often lower.
- Final costs are invariably lower. Pieces are rolled close to final tolerances, so expensive machining time is greatly reduced.
- We offer extra services—rough machining, finish machining, drilling, splitting, parting—that often cost less in our shop than elsewhere.
- You get fast service—no costly delays to your production schedule.

In addition to rings and flanges, Standard Steel Works can furnish you with shafts, wheels, gear blanks and special shapes. Next time you need forgings of any kind, get our quotation first. For your copy of our new bulletin, write Dept. 9046, Standard Steel Works Division, BLH Corporation, Burnham, Pa.

STANDARD STEEL WORKS DIVISION
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DIVISIONS: Austin-Western • Eddystone • Hamilton • Lima • Electronics & Instrumentation • Madsen • Pelton • Loewy-Hydropress • Standard Steel Works

NEW literature

Write directly to the company for a copy

Shell Core Blower

A 4-page bulletin presents a machine for blowing shell cores. Shell Process Inc., McKinstry Ave., Chicopee, Mass.

Cycle Counter

A 4-page bulletin describes a load cycle counter that counts only work or operations performed. Ram Meter Inc., 1100 Hilton Rd., Ferndale, Detroit 20, Mich.

Conveyor Roll Bearings

A line of ball bearings for belt conveyor rolls is presented in bulletin 1529-1, 4 pages. Marlin-Rockwell Corp., Jamestown, N. Y.

Synchronous Motors

Bulletin 05B8305, 4 pages, describes large, end-shield bearing, synchronous motors for direct-connected or geared applications. Allis-Chalmers Mfg. Co., 1021 S. 70th St., Milwaukee, Wis.

Heat Resistant Castings

A 16-page bulletin discusses alloy composition and properties, limitations, stabilizing influences and heat treatment of heat and corrosion resistant castings. Michigan-Standard Alloy Casting Co., 1999 Guoin St., Detroit 7, Mich.

Injection Molding

Operating features of vertical plastic molding machines in 1, 2, 6, 16 and 24-ounce capacities are described in bulletin 627-B, 8 pages. Watson-Stillman Press Division, Farrel-Birmingham Co. Inc., 109 Aldene Rd., Roselle, N. J.

Stationary Batteries

Flat-plate batteries in transparent containers with polystyrene covers are described in bulletin 5907, 4 pages. Department TC, Exide Industrial Division, Electric Storage Battery Co., Box 8109, Philadelphia 1, Pa.

Tooling Balls

A data sheet lists stainless steel tooling balls used as reference points in gage, fixture and tool work. Industrial Tectonics Inc., 3684 Jackson Rd., Ann Arbor, Mich.

Hydraulic Drives

Bulletin 15011, 8 pages, describes industrial rotating hydraulic drives for use in automatic handling. Oilgear Co., 1593C W. Pierce St., Milwaukee 4, Wis.

Melting Furnace Accessories

Auxiliary items used with foundry melting furnaces are listed in an 8-page bulletin. Lindberg-Fisher Division, Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill.

Mechanical Tubing

Tolerance tables and size ranges of carbon and stainless steel tubing are listed in charts and pocket-size booklets. Steel & Tubes Division, Republic Steel Corp., 224 E. 131st St., Cleveland 8, O.

Rotary Grinders

Twin rotary production grinders are detailed in bulletin TR56, 8 pages. Thompson Grinder Co., Springfield, O.

Batch-Type Furnaces

Furnaces with an operating range from 1400 to 1750°F for gas carburizing, clean hardening, dry cyaniding, carbon restoration, homogeneous

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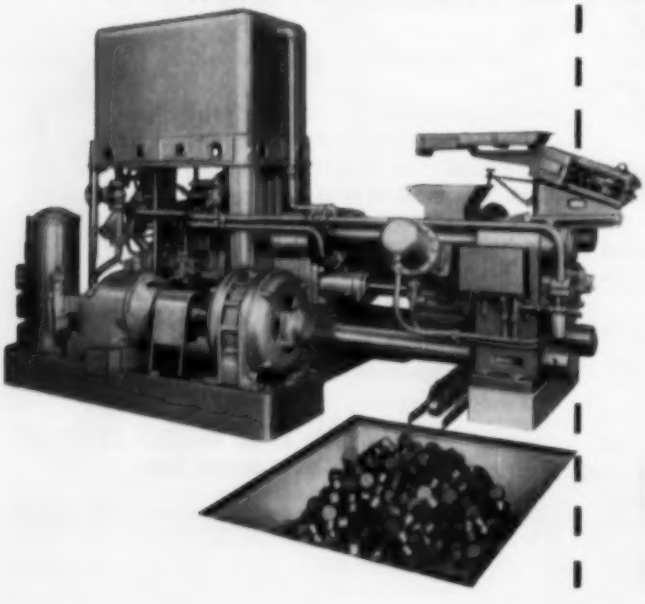
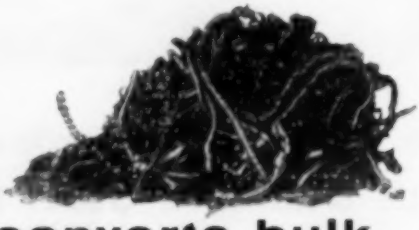
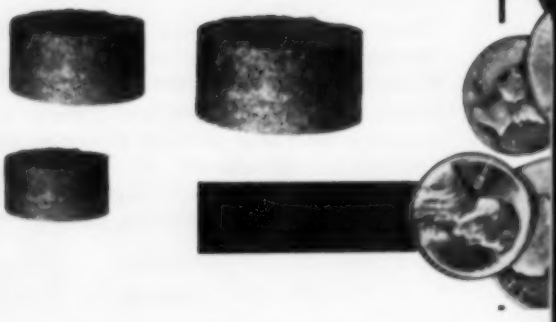
"metal-working mint"





converts bulk
machine tool scrap
into briquettes



carburizing, clean annealing and oil quenching are covered in bulletin SC-174, 4 pages. Surface Combustion Corp., Toledo 1, O.

Tool Steel Hardening

Furnaces for hardening tool steels without scale, decarb or carburization are described in bulletin 97-HS, 4 pages. Furnace Division, Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill.

Carbide Tips

A 32-page catalog gives information on carbide uses, carbide tools and selection of carbide grades. Advertising Department, Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Boring Heads

Precision boring heads and an adjusting principle for close tolerance boring are illustrated in 12-page bulletin 6B. Briney Mfg. Co., P. O. Box 2208, Pontiac, Mich.

Vertical Conveyor

Bulletin ALV-130, 4 pages, describes a conveyor that automatically transfers palletized cases up or down. Alvey Conveyor Mfg. Co., 9301 Olive Street Rd., St. Louis 24, Mo.

Power Steering

Power steering for this company's fork lift trucks of 6000-lb capacity and over is described in a folder. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O.

Molding Machine

Bulletin JSI-4-56, 4 pages, describes a two-station, indexing type, jolt, squeeze, strip machine. Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh 22, Pa.

Chromium Plating

A file folder reviews a chromium plating additive for both decorative and hard-chrome applications. Chromium Chemicals Division, Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, O.

Retractable Cords

Cords that extend to six times their retracted length are shown in bulletin 556, 12 pages. Koiled Kords Inc., Box K, New Haven 14, Conn.

Rivets

Bulletin 42, 16 pages, describes 1388 semitubular, full tubular and split rivets and bags, studs and rivet caps. Chicago Rivet & Machine Co., 950 S. 25th Ave., Bellwood, Ill.

Hose Couplings

Bulletin 18 lists hose couplings, clamps, nipples and hydraulic assemblies, valves and manifolds—8 pages. Hose Accessories Co., 2700 N. 17th St., Philadelphia 32, Pa.

Torque Converter

A three-stage torque converter with a standard output shaft assembly and three input arrangements is described in bulletin 507. Hydraulic Division, Twin Disc Clutch Co., Rockford, Ill.

Mounted Wheels

A 36-page booklet lists maximum operating speeds and safety rules for mounted abrasive wheels. Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, O.

Portable Conveyor

Bulletin 8L 566 describes a portable power belt conveyor with a hydraulic adjusting control unit—2 pages. Speedways Conveyors Inc., Speedways Bldg., Buffalo 13, N. Y.

Turret Tool Holders

Sleeves, extension sockets and turret toolholders are described in bulletin 7-50, 4 pages. Scully-Jones & Co., 1901 S. Rockwell St., Chicago, 8, Ill.

and extra profits ...automatically!

MILWAUKEE BRIQUETTING PRESSES INCREASE SCRAP VALUE $20.00 PER TON . . . OR MORE . . . by converting bulk borings, turnings and chips into briquettes. Classifying as high-grade scrap, briquettes are small, dense and uniform in size . . . eliminate scrap handling problems . . . require minimum storage space per ton . . . assure a more profitable operation for high-production metal-working plants of all types.

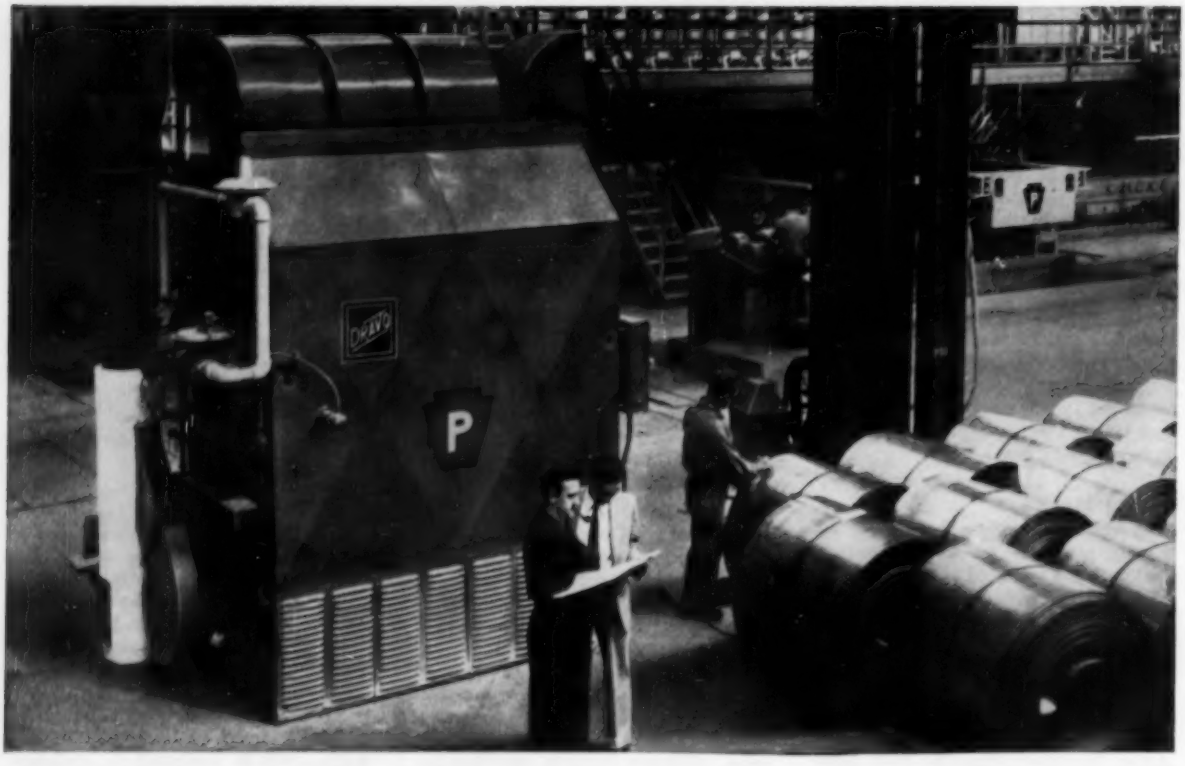
Six models of these automatic hydraulically-operated presses are available. Capacities range from ¾ to 3½ tons per hour.

FOR DETAILS AND PRICES, WRITE FOR BULLETIN 117.

SPO

MILWAUKEE Foundry Equipment Division

6494 GRAND DIVISION AVENUE
CLEVELAND 25, OHIO



Pittsburgh Steel Installs 60 Dravo Heaters

To provide uniform heat in winter and ventilation in summer, 60 Dravo *Counterflo* Space Heaters were installed in Pittsburgh Steel Company's new hot strip and cold rolled steel mills at Allenport, Penna. These new mills are part of the company's 62-million-dollar "Program of Progress."

Each Dravo Heater, a complete heating unit in itself, is equipped with a combination burner that can use either gas or oil as fuel, depending upon the available supply. These efficient heaters eliminated the need for a costly steam installation.

Today more than 2,500 users, large and small, have installed Dravo *Counterflo* Space Heaters for heating and ventilating foundries, warehouses, machine shops, stores, schools and similar buildings. The initial cost is usually much less than a steam or hot water heating system.

The Dravo *Counterflo* Heater is safe, economical, flexible and automatic. It is approved by American Gas Association and listed by Underwriters' Laboratories, Inc.

For over 60 years Dravo has been serving business and industry in a variety of engineering fields. Dravo considers customer satisfaction an essential factor in all its products and services. DRAVO CORPORATION, PITTSBURGH 25, PENNA.

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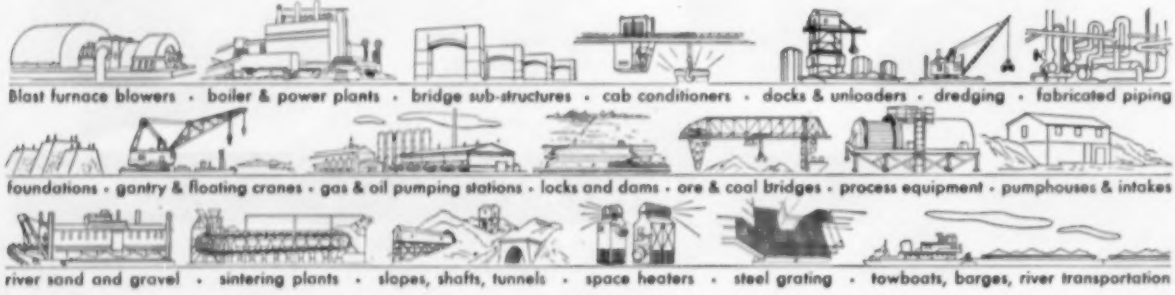

Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping
foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes
river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

Market Outlook

LOOK for steel demand to outstrip supply the rest of this year. Producers of durable goods have an order backlog 18 per cent greater in dollar volume than they had a year ago. Their steel consumption the rest of this year should exceed that of the corresponding period of 1955.

Consumers' inventories of steel, generally large before this summer's five-week steel strike, shrunk some as consumers lived off them during that period. Consumers can't remain out of the market for long.

STILL LOSING— The five-week strike deprived the nation of around 10 million ingot tons of steel, and losses will mount further until steel production can get into full swing. U. S. Steel Corp. figured it could have open-hearth furnace production up to 75 per cent of capacity in a week and up to 90 per cent at the end of two weeks. From then on, the climb to full capacity will be relatively slow, the corporation said.

Just before the strike started, national ingot production was at 97 per cent of capacity. That's where it was a year ago before the one-day strike—and it couldn't get back up there until four months later, despite the strong demand for steel—although there was an immediate recovery to around 93 per cent.

PICK-UP— In the week ended Aug. 12—first week of steel production after the latest strike—output of steel for ingots and castings climbed to 52.5 per cent of capacity. This is a 33-point recovery over the preceding week, when only the unstruck capacity was in operation.

BUILD-UP— The five-week strike put mills behind in deliveries. Orders came in during the strike, and they'll continue to roll in. The sales manager for one steel company said: "We don't know what we'll do with the orders. We may have to send some of them back to customers."

A few days ago, Eugene G. Grace, chairman of Bethlehem Steel Co., revealed his company has a full three months of bookings of steel orders on hand.

Now that base prices of steel have risen, steel demand will reflect only the needs for consumption. Pricewise, there's no incentive now to lay in inventory. Any building of inventory will be for supporting a high rate of usage.

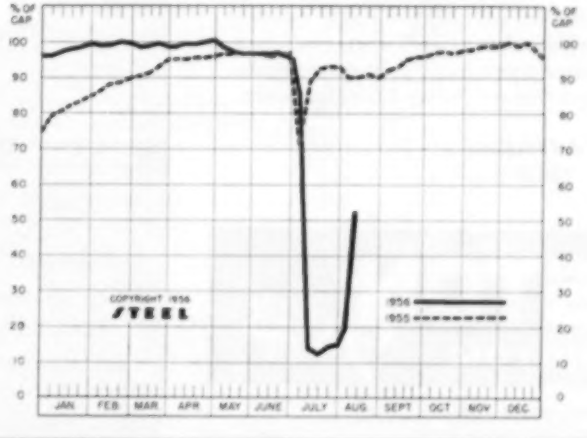
SURPRISE— The price increase, averaging $8.50 a ton, or 6.25 per cent, was lower than most people expected. It is higher than last year's increase: The average was $7.35 a ton, or 5.8 per cent.

PROBLEMS— Clifford F. Hood, president of U. S. Steel, pointed out that the new prices don't solve the problem of inadequate depreciation allowances for replacement of facilities or provide funds for expansion. There's belief the government will supply some aid in this area through a fast tax amortization program.

REFLECTIONS— The new prices were being reflected in STEEL's price composite on finished steel. In the week ended Aug. 8, it reached $137.75 a net ton, a $6.48 rise over the preceding week's level.

Steelmaking scrap prices continue to reflect expected strong demand. In the week ended Aug. 8, STEEL's steelmaking scrap price composite moved up to $54.83 a gross ton, a $1.66 increase over that of the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Aug. 12	Change	Same Week 1955	Same Week 1954
Pittsburgh	48	+46	95	62
Chicago	60	+52*	95	69
Mid-Atlantic	78	+53*	94	57
Youngstown	50	+45	100	65
Wheeling	73	+18.5	97.5	78
Cleveland	60.5	+60.5	97.5	61
Buffalo	55	+55	105	56
Birmingham	15	+11.5	23	64.5
New England	74	— 3	86	55
Cincinnati	77	— 1.5	88	54.5
St. Louis	96	— 7	98	54.5
Detroit	43	— 5	88.5	50
Western	30	0	103	83
National Rate	52.5	+33	90	64

INGOT PRODUCTION‡

	Week Ended Aug. 12	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	80.3†	25.8	19.7	134.3
NET TONS (In thousands)	1,290†	415	317	2,157

*Change from preceding week's revised rate
†Estimated ‡Amer. Iron & Steel Institute
Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954

Metalworking Outlook—p. 43 Technical Outlook—p. 99

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Who Uses Stainless Steel

(First Quarter, 1956)

End Use Market Classifications	Net Tons Received from Mills & Warehouses	Per Cent of Total from Mills & Warehouses	Net Tons Received from Mills	Per Cent of Total from Mills
CONSUMER PRODUCTS				
Automotive	28,793	16.1	.....	...
Appliances	6,119	3.4	.....	...
Household and cooking utensils	5,346	3.0	.....	...
Cutlery and table flatware	4,844	2.7	.....	...
Household furniture	1,277	0.7	.....	...
Other consumer products	2,562	1.4	.....	...
Total	48,941	27.3	43,950	24.6
COMMERCIAL & PROFESSIONAL EQUIPMENT				
Surgical and dental equipment	1,043	0.6	.....	...
Other scientific and professional equipment	1,414	0.8	.....	...
Restaurant and commercial equipment	6,506	3.6	.....	...
Total	8,963	5.0	2,780	1.6
CONSTRUCTION & BUILDING MAINTENANCE				
Plumbing, heating, air conditioning	3,528	2.0	.....	...
Builders' hardware, architectural and ornamental work	4,235	2.4	.....	...
Sheet metal shops	2,052	1.1	.....	...
All other construction	3,523	2.0	.....	...
Total	13,338	7.5	6,339	3.6
INDUSTRIAL MACHINERY & EQUIPMENT, OTHER INDUSTRIAL USES				
Chemical industry equipment	3,357	1.9	.....	...
Oil and gas equipment	1,846	1.0	.....	...
Pulp and paper processing equipment	2,326	1.3	.....	...
Textile processing equipment	1,976	1.1	.....	...
Dairy equipment	3,181	1.8	.....	...
Other food and beverage equipment	3,454	1.9	.....	...
Electrical	5,250	2.9	.....	...
Metalworking equipment	3,560	2.0	.....	...
Farm	478	0.3	.....	...
Railroads	1,250	0.7	.....	...
Shipbuilding	1,054	0.6	.....	...
Fasteners	5,286	3.0	.....	...
Containers and closures	1,329	0.7	.....	...
Steel forgers, converters and redrawers	20,576	11.5	.....	...
Aircraft	12,810	7.2	.....	...
Ordnance	1,526	0.9	.....	...
All other machinery	11,967	6.7	.....	...
Total	81,226	45.5	47,048	26.3
EXPORT	5,855	3.3	5,601	3.1
UNREPORTED MILL SHIPMENTS	20,312	11.4	20,312	11.4
WAREHOUSES	.....	...	52,605	29.4
Grand Total	178,635	100.0	178,635	100.0

Study Reveals Customers

Aircraft industry is biggest buyer of stainless steel from warehouse stocks, first quarter figures show

FOR the first time steel mills are finding out who is buying stainless from warehouses.

Shipments from mills to warehouses rose from 19.5 per cent of total shipments in 1946 to 29.4 per cent in the first quarter.

To find out who ultimate users are, the American Steel Warehouse Association and the Committee of Stainless Steel Producers of the American Iron & Steel Institute joined forces to conduct a survey in the first and second quarters. For results of the first-quarter study, see the accompanying table.

As Expected—Results show little change in the position of top users—automotive, utensil and flatware producers. Mills supply most of their needs. Mill shipments to the auto industry in the first quarter amounted to 27,603 net tons. Combined mill and warehouse shipments were only 1190 tons more—28,793. Utensil producers got only 318 tons from warehouses, 5028 tons from mills during the period. Their total take was 5346 tons.

Eye Opener—The most revealing discoveries were made among users not in the top bracket. While the aircraft industry is about the fourth largest taker of mill shipments, it is the largest user of warehouse stainless. In the first quarter, the industry received 7647 tons from mills and 5163 tons from warehouses, making a total of 12,810 tons.

Makers of restaurant and commercial equipment use three times as much stainless (6506 tons) as they get from mills. Producers of pulp and paper machinery bought only 365 tons from mills, but they got a total of 2326 tons from mills and warehouses in the first quarter. Makers of textile processing equipment purchased 229 tons coming from mills, 1747 from warehouses—a total of 1976 tons.

Although the auto industry is the largest single user of stainless (16.1 per cent), industrial machinery and equipment make up the largest group of users (45.5 per cent).

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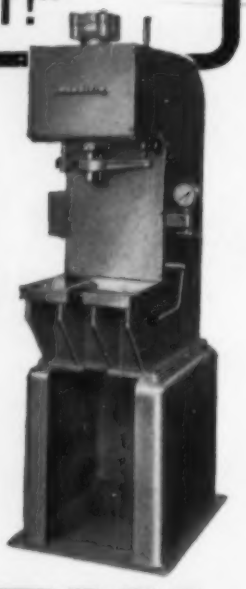

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Steel Bars . . .

Bar Prices, Page 149

Barmakers are expected to be quick to follow the U. S. Steel Corp. in raising prices on hot-rolled, cold-drawn and alloy bars. The new schedule of the corporation went into effect Aug. 7. Several other makers immediately followed with similar increases.

Under the new schedule, hot-rolled carbon bars, merchant quality and special quality, are quoted $8.50 a ton higher; hot-rolled alloy bars are up $11; cold-drawn carbon bars are quoted $12 higher; cold-drawn alloy, $18 higher.

Hot carbon bar sellers generally cannot make definite commitments on new orders for the fourth quarter. They don't know what their carry-overs will be and how much new tonnage they will be able to handle. Some may have to blank out a month's production, especially on the large sizes.

Sellers of cold-finished bars whose plants were not affected by the strike are offering fourth quarter tonnage for firm delivery in October and beyond.

Steel Export Prices Raised

United States Steel Export Co., New York, has revised its export price bases, effective Aug. 8. The changes reflect revisions in domestic prices (effective Aug. 7) announced by U. S. Steel Corp. and its general operating divisions. New export prices include freight to New York, Philadelphia and Baltimore.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 150 & 151

Producers of sheets and strip will have substantial order carry-overs on hot and cold-rolled, galvanized sheets and certain specialties, including enameling stock and electrical sheets, going into the fourth quarter.

One large producer estimates it will have to blank out October and half of November on hot and cold-rolled sheets to care for the overflow.

Midwestern mills experienced little customer pressure for steel in the week immediately preceding the relighting of furnaces. It is figured such pressures won't develop until shipments have been

restored to a good clip and users develop concern as to when needed items will arrive at their plants.

Few serious pinches are expected to develop for any products, except plates and shapes. Even automotive demands are expected to roll along smoothly until late in the year when assembly of new models swings into high gear.

In New England, users are not crowding the mills for fourth quarter tonnage. Sheet and strip inventories are reported heavier than estimated, running three to four months in some cases.

U. S. Steel Corp. advanced prices on carbon sheets $7 a ton; on cold-rolled, $8.50; hot-rolled high strength low alloy sheets, $10.50; cold-rolled high strength low alloy sheets, $13; galvanized sheets, $9; enameling sheets, $8.50; hot-rolled strip, $7. Similar advances, effective the same date, Aug. 7, were announced by Republic Steel Corp., and other leading producers were expected to take similar action before the end of the week. The Stanley Works, New Britain, Conn., advanced cold-rolled strip $12 a ton, the same as American Steel & Wire Division, U. S. Steel, and Republic Steel.

Plates . . .

Plate Prices, Page 149

Some plate fabricators have been forced to suspend operations because they lack steel. Others probably will have to close down temporarily before tonnage starts flowing to them from the mills in sufficient volume to support steady operations. Tonnages they receive will be against old orders for some time. Some plate mills hold out little hope of being able to supply new tonnage before late in the year, if then.

Mills not affected by the strike which were given a substantial increase in rated work by the Defense Administration early in July have not been advised of any reduction in the stepped up set-asides now that the strike is over. The increase in rated work was to have become effective in September and October. In at least one case set-asides were quadrupled for those months.

Consumers were unable to obtain sufficient stocks of plates be-

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(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

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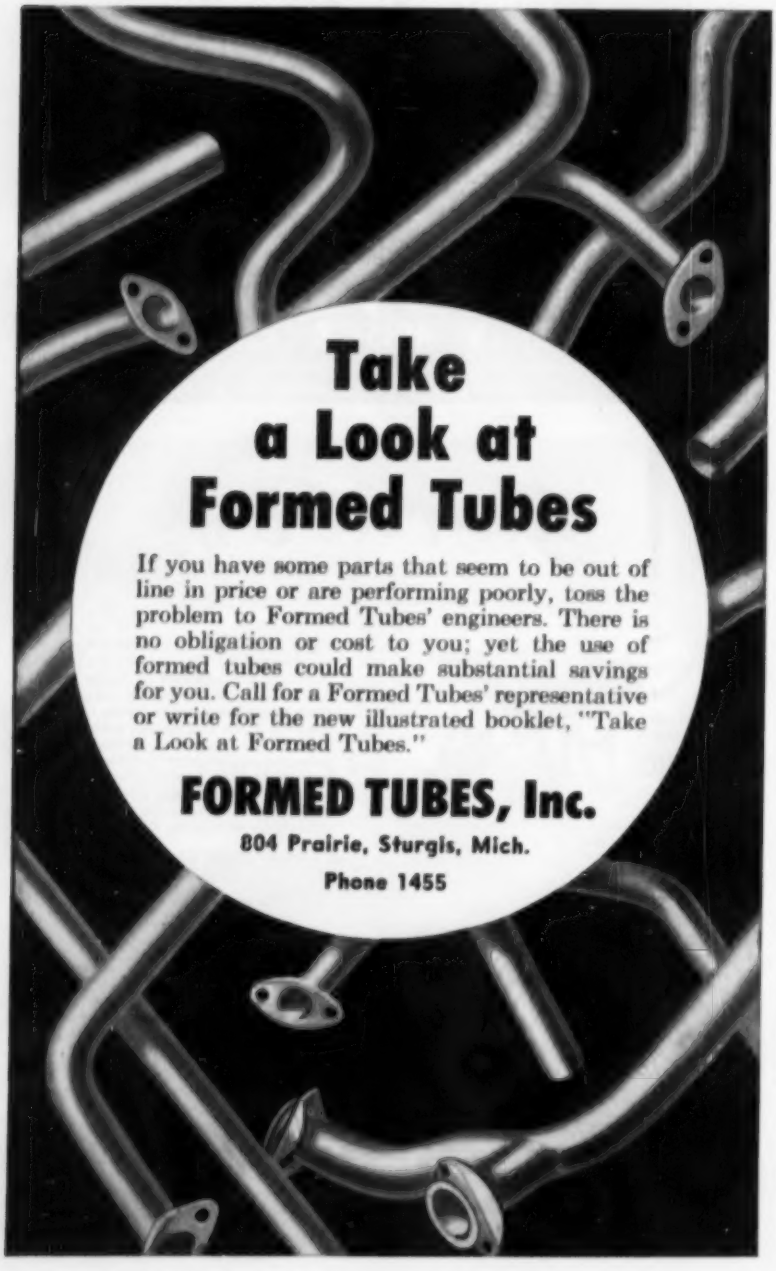
fore the strike. Now their situation is still more complicated. Some believe it will be weeks before they will be able to obtain as much tonnage as they did prior to the work stoppage, and their stocks are virtually nil. Probable result: Further suspensions of plate fabricating operations. While plate supplies are short in New England, inventories are most critical in the heavier and wider sizes. A large volume of light gage plates from the sheet-strip mills in June eased the tight situation in those sizes. Small tank shops were helped, but they expect strip-plate tonnage will be smaller from here on. Shops are hampered in estimating long-range jobs because of the supply and cost uncertainty.

Carbon plates and floor plates were advanced $7 per ton effective Aug. 7 by U. S. Steel Corp. Similar advance was made by Republic Steel Corp. Other producers are expected to follow. Phoenix Iron & Steel went up $14 a ton.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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 149

Demand for reinforcing steel is reported to be at an all-time high in some markets. Indications are pressure for tonnage will increase as the shortage of structural shapes persists and more jobs are changed to reinforced concrete construction. Long term demand for large tonnages is expected from the heavy road building program.

Prices are higher. U. S. Steel effected an increase of $8.50 per ton on reinforcing bars. Other producers were expected to take similar action. In the Pacific Northwest, mills in Portland, Oreg., announced increases of $9 a ton on reinforcing items and shapes.

An unexpected strike closed the plant of the Northwest Steel Rolling Mills Inc., Seattle, at midnight, July 31—it had operated throughout the month. The dispute is said to be unrelated to the national steel strike. In Portland, Oreg., the Oregon Steel Mills, which also operated through July, continues to work under an interim agreement with the union—a two-week extension on its contract which expired on July 31.

Wire . . .

Wire Prices, Pages 151 & 152

Price increases on wire products range all the way from $8.50 per ton on wire rods to $20 on bale ties. Most producers are expected to follow the lead of U. S. Steel Corp., but some deviation is likely.

Under the U. S. Steel's new schedule, wire rods are up $8.50 a ton; manufacturers bright low carbon wire, $12; MB spring wire, $16.50; nails and staples, $15; merchant quality wire, $12; barbed wire, $12; woven fence, $19; bale ties, $20.

Low and unbalanced stocks of semifinished steel will mean it will be four to six weeks before mills can become current with orderly schedules. Nonintegrated producers (most of them operated without interruption, except for vacations) have reduced their rod inventories.

Wire mills are accepting orders with open delivery provisions, planning to fix definite shipping dates later. Buying on this basis is re-

ported moderate. Heavy pre-strike shipments bolstered consumer inventories, and consumption in many cases is down from the first half average. Heavier requirements are likely to develop as mills approach normal production.

The General Stores Supply Office of the Navy, Philadelphia, has taken estimates on approximately 1925 tons of steel welding electrodes. They are for delivery at east and west coast yards. The tonnage was erroneously reported as 925 a week ago.

Warehouse . . .

Warehouse Prices, Page 154

Warehouses have limited inventories of plates and shapes. Some also report a substantial shrinkage in their sheet stocks over recent weeks. Their supply situation in bars and other merchant products is described as still fairly good. In these lines, it is thought stocks will prove adequate until mill shipments get back to something like normal.

Two weeks ago, demand on the warehouses noticeably softened in the Chicago market when the overall wage settlement was reached. The slackening in demand has continued since, and buying the remainder of August is expected to be quiet.

Interpretation of this warehouse trend is that inventories of steel consumers are in pretty good shape. This, does not apply to plates and shapes, demand for which continues strong. Warehouse inventories of plates and shapes were cleaned out early in the strike.

Warehouses are revising their prices in line with the mill advances effected last week. The usual markups are being applied.

Tubular Goods . . .

Tubular Goods Prices, Page 153

Price increases on pipe and tubular products range from $9.50 per ton on electricweld line pipe to $21.25 for drill pipe.

Increases announced by U. S. Steel Corp. (effective Aug. 7) are:

Buttweld standard pipe and line pipe, black and galvanized, up $12; seamless pipe, standard and line, black and galvanized, up $12; seamless and electric weld, standard and line pipe, black and galvanized, up $11.50; electricweld line pipe, 26-36 in., up $9.50; oil country casing, grade J55, short T & C, all sizes, $13.75; oil country tubing, grade J-55, upset T & C, all sizes, $14.25; drill pipe, grade D, internal upset, all sizes, $21.25; seamless pressure and mechanical tubing, carbon, up about 8.5 per cent, alloy, about 7.5 per cent.

Armco Steel Corp. will increase its production of spiral-welded pipe piling by one-third. The firm will build an $800,000 plant at Middletown, O.

Pig Iron . . . .

Pig Iron Prices, Page 154

Rising prices on cast iron scrap will encourage use of more pig iron in foundry melts. So far the influence is not being felt by midwestern merchant iron sellers, indicating that foundry stocks still are substantial as result of the June inventory build-up and numerous closing of foundries for vacations last month and this one.

August is proving to be a dull month, as was anticipated. Sept-

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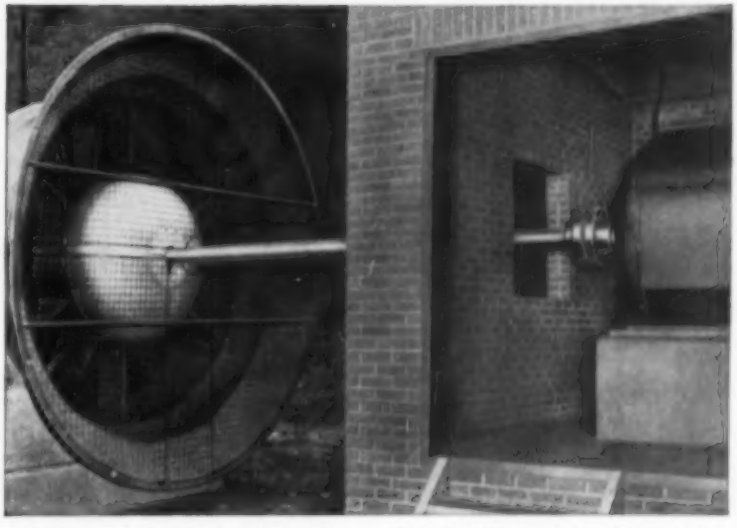

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tember should see a nice upturn. In the East, foundry activity probably will not get under full swing until after Labor day.

The Phoenix Iron & Steel Co., Chester, Pa., advanced prices $2.50 a ton to $64.50 per gross ton, furnace, on basic pig iron; $65, No. 2 foundry; and $65.50 for malleable.

U. S. Steel Corp. subsidiaries advanced prices $2.50 per ton on the various grades of pig iron, effective Aug. 8. Republic Steel Corp. raised its pig iron prices $4 a ton at Birmingbam and Alabama City, Ala., effective Aug. 4, and $2.50 a ton at Buffalo, Cleveland, Troy, N.Y., and Chicago, effective Aug. 6.

Structural Shapes . . .

Structural Shape Prices, Page 149

Structural steel fabricators see months of heavy demand ahead. There is a diversity of inquiry, with emphasis on bridges, industrial and office building construction.

Generally, programs have been set back by the strike. Fabricators are not likely to be receiving steel from the mills in pre-strike volume for several weeks.

Structural awards in June declined to 337,230 tons, compared with 358,271 in May, but brought the total for the first six months up to 2,176,230 tons, a gain of 32 per cent over the corresponding period a year ago, reports the American Institute of Steel Construction.

Shipments of 284,719 tons slipped from the near record level of 306,223 in May. The midyear total was 1,724,196, a 22 per cent increase over the first six months of 1955.

Order backlogs amounted to 2,858,981 tons as of June 30, little changed from the preceding month's. Of this total, 1,103,335 tons were scheduled for fabrication through October.

U. S. Steel Corp. raised prices on standard and wide flange structurals $8 per ton, effective Aug. 7. Sheet steel piling went up $9 and bearing piles $8. Republic Steel Corp. advanced its prices similarly. Other producers are expected to take like action. One maker, Phoenix Iron & Steel Co., Phoenixville, Pa., increased its prices $14.

Ferroalloy Prices

FERROALLOY quotations remain unchanged except for spiegeleisen which is up $2 a ton to $98.50. The price schedule was given on page 171 of the Aug. 6 issue.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

8520 tons, two buildings, Prudential Life Insurance Co., Newark, N. J., with 7370 tons for the so-called corporate building going to the American Bridge Division, U. S. Steel Corp., Pittsburgh, and 1150 tons for the so-called south building to the Ingalls Iron Works Co., Birmingham, Ala.; awards made through Voorhees, Walker, Smith & Smith, New York.

6500 tons, transmission towers, American Gas & Electric Service Corp., New York, to a Milan, Italy, fabricator; this is the second such order to have been placed by this company with Italian interests in recent months; at least 16,000 tons of transmission towers are on inquiry for American Gas & Electric.

5550 tons, Atlantic office building, 45 Wall street, New York, through Starrett Bros. & Eken, that city, to Dreier Structural Steel Co. Inc., Long Island City, New York.

5550 tons, superstructure, state highway bridge, Tennessee river, Chattanooga, Tenn., to Bethlehem Steel Co., Bethlehem, Pa.

5000 tons, 20-story office building, Uris Bros., Penn Center, Philadelphia, to Harris Structural Steel Co., New York.

3925 tons, state highway bridge superstructure, Connecticut river, Holyoke-South Hadley, Mass., to Mt. Vernon Bridge Co., Mt. Vernon, O., $2,195,895 on direct bids.

2000 tons, Pierce county-city building, Tacoma, Wash., to Isaacson Iron Works, Seattle; MacDonald Building Co., Tacoma, general contractor.

1270 tons, Third avenue substation, Board of Transportation, Brooklyn, N. Y., to Schacht Steel Construction Inc., New York.

1200 tons, power dam components, St. Lawrence power project, trash racks, stoplogs and lifting beams; New York State Power Authority, to Alco Products Inc., Dunkirk, N. Y.

1035 tons, hospital and service building, St. Charles Hospital, West Islip, Long Island, N. Y., through Caye Construction Co., general contractor, to Grand Iron Works, Bronx, New York.

950 tons, six grade separations and one bridge over a railroad, Connecticut turnpike project 329-01, Plainfield, to Grand Iron Works, Bronx, New York; L. G. DeFelice & Sons Inc., New Haven, Conn., general contractor.

410 tons, state highway bridge, Revere Beach Parkway, Medford-Everett, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Berke-Moore Co., Boston, general contractor.

250 tons, two-span rolled beam bridge, Madison, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Lane Construction Co., Meriden, Conn., general contractor.

230 tons, state highway bridge, St. James avenue, Springfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Berke-Moore Co., Boston, general contractor.

200 tons, two beam span bridges, Providence, R. I., to Tower Iron Works, Providence, through Campanella & Cardi Construction Co., Hillsgrove, R. I., general contractor.

STRUCTURAL STEEL PENDING

16,000 tons, transmission towers, American Gas & Electric Service Corp., New York, bids asked.

16,000 tons, office building, Joseph P. Blitz, Park Ave., New York, contemplated.

8000 tons, atomic power unit, Consolidated Edison Co., Indian Point, N. Y., bids closed.

5000 tons, municipal court building, lower Manhattan, New York, bids Aug. 16.

4755 tons, Kneeland-Dover street spur, Central artery, Boston.

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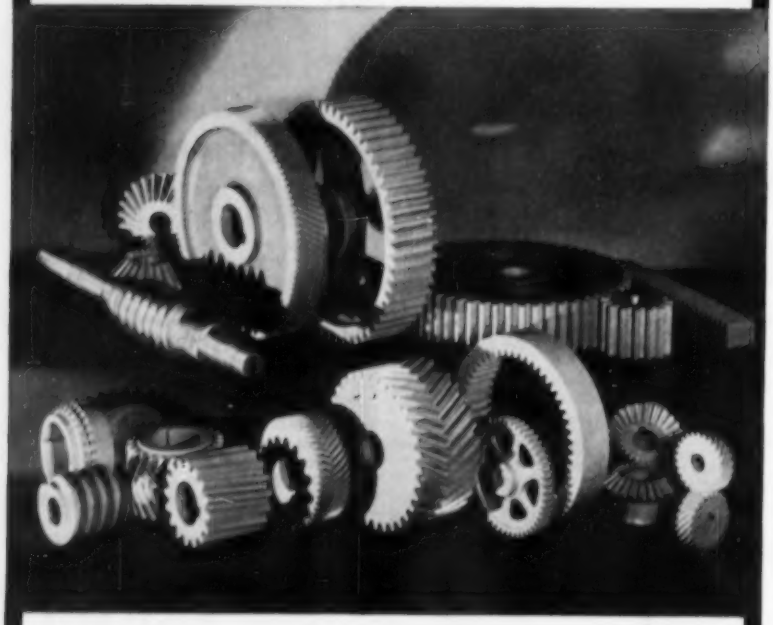

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Send note on Company Letterhead for complete H & S Catalog

3300 tons, Division street bridge, Pawtucket, R. I.; out this fall.

1200 tons, Air Force Academy, Colorado Springs, Colo.; J. W. Bateson Co., Dallas, low at $2,483,893 for first eight buildings.

550 tons, state highway bridge, Jonesport-Beals, Me.; bids Aug. 22, Augusta, Me.; also 400 tons, steel H-beam piles.

315 tons, state highway bridge, Naugatuck river, Waterbury, Conn.; also 130 tons of reinforcing bars and 200 tons of sheet piling.

REINFORCING BARS . . .

REINFORCING BARS PLACED

700 tons, Pierce county-city building, Tacoma, Wash., to J. D. English Steel Co., Tacoma; MacDonald Building Co., Tacoma, general contractor.

270 tons, City Hall, Shreveport, La., to Mosher Steel Co. of Louisiana, New Orleans, through Southern Builders Inc., Shreveport, general contractor.

175 tons, two state bridges, Providence, R. I., to U. S. Steel Supply Division, U. S. Steel Corp., Boston, through Campanella & Cardi Construction Co., Providence, general contractor.

REINFORCING BARS PENDING

150 tons, Washington state slab bridge, Douglas county; bids to Olympia, Wash., Aug. 21.

135 tons, Washington state box girder span, Yakima county; general contract to H. M. Skov Construction Co., Yakima, low at $172,700.

100 tons or more, Washington state slab bridge, King county; general contract to Fiorito Bros., Seattle, low at $307,971.

100 tons plus, five ammunition storage igloos, Paine Field, Washington; June bid call withdrawn, new date to be set by U. S. Engineer, Seattle.

60 tons, reinforcing and miscellaneous, two pump plants, Columbia Basin project; Louis Hopkins Co., Pasco, Wash., low at $309,776, to the Bureau of Reclamation, Ephrata, Wash.

Unstated, Oregon state road projects, bids Aug. 16 at Portland, Oreg.; Grant county, four precast concrete spans; Josephine county, two concrete bridges, also piers for Finch river bridge; Clatsop county, Necanicum river bridge; Marion county, eight precast bridge spans.

PLATES . . .

PLATES PLACED

1200 tons, four fuel storage tanks, Ft. Richardson, Alaska, to Wyatt & Kipper, Seattle; Patti-MacDonald Co., St. Louis, general contractor.

PLATES PENDING

1700 tons, two tanks, Sinclair Refining Co., New York, bids asked.

1000 tons, large diameter steel pipe, jet engine test facilities, Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn.

100 tons, welded water tank, Lakewood district, Tacoma, Wash.; American Pipe & Construction Co., Portland, Oreg., low at $49,540.

100 tons, 1-million-gal standpipe, Eugene, Oreg.; Pittsburgh-DesMoines Steel Co., Seattle, is low at $57,280.

100 tons, 14 tanks, ten of 13,000 gal capacity each, fuel oil, Corps of Engineers, Chicago.

Unstated, 10,500 ft of 10 to 16-in. welded steel pipe; bids to Rainier, Oreg., Aug. 13; materials supplied by the city.

PIPE . . .

CAST IRON PIPE PENDING

170 tons, system expansion; bids in to Kelso, Wash.

RAILS, CARS . . .

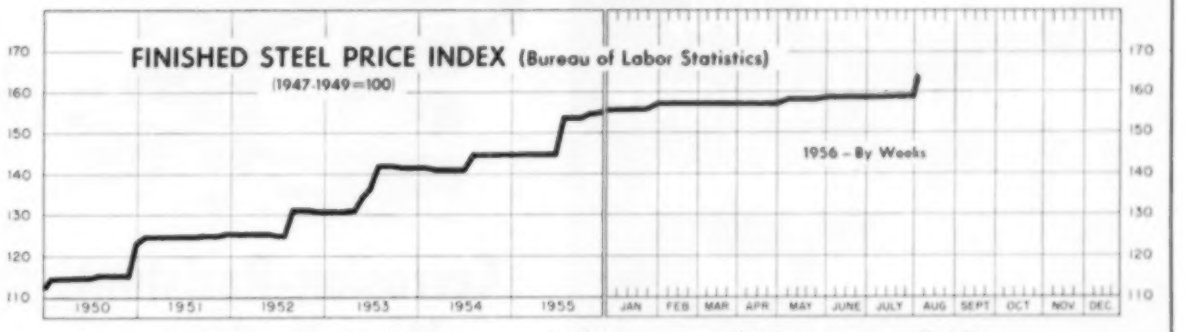
RAILROAD CARS PLACED

Central of Georgia, five 70-ton dropend gondolas, to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

Bangor & Aroostook, 500 boxcars.

Price Indexes and Composites



Aug. 7, 1956	Week Ago	Month Ago	July Avg.	Year Ago
164.3	158.6	158.3	158.6	153.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Aug. 7—Price revisions pending

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$4.800	Bars, Reinforcing	5.313
Rails, Light, 40 lb	6.217	Bars, C.F., Carbon	9.000
Tie Plates	5.625	Bars, C.F., Alloy	12.375
Axles, Railway	8.350	Bars, C.F., Stainless, 302 (lb)	0.475
Wheels, Freight Car, 33 in. (per wheel)	52.50	Sheets, H.R., Carbon	5.345
Plates, Carbon	5.299	Sheets, C.R., Carbon	6.214
Structural Shapes	4.867	Sheets, Galvanized	7.770
Bars, Tool Steel, Carbon (lb)	0.469	Sheets, C.R., Stainless, 302 (lb)	0.590
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Sheets, Electrical	10.175
Bars, Tool Steel, H. R. Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Strip, C.R., Carbon	8.486
Bars, Tool Steel, H.R., Alloy, High Speed W18, Cr 4, V 1 (lb)	1.680	Strip, C.R., Stainless, 403 (lb)	0.453
Bars, H.R., Alloy	9.475	Strip, H.R., Carbon	5.650
Bars, H.R., Stainless, 303 (lb)	0.450	Pipe, Black, Buttweld (100 ft)	16.997
Bars, H.R., Carbon	5.500	Pipe, Galv., Buttweld (100 ft)	21.137
		Pipe, Line (100 ft)	170.038
		Casing, Oil Well, Carbon (100 ft)	165.120
		Casing, Oil Well, Alloy (100 ft)	256.030
		Tubes, Boiler (100 ft)	41.530
		Tubing, Mechanical, Carbon (100 ft)	21.360
		Tubing, Mechanical Stainless, 304 (100 ft)	178.897
		Tin Plate, Hot-dipped, 1.25 lb	9.333
		Tin Plate, Electrolytic, 0.25 lb	8.033
		Black Plate, Canmaking Quality	7.133
		Wire, Drawn, Carbon	8.575
		Wire, Drawn, Stainless, 430 (lb)	0.590
		Bale ties (bundle)	6.537
		Nails, Wire, 8d Common	8.595
		Wire, Barbed (80-rod spool)	7.847
		Woven Wire Fence (20-rod roll)	18.635

STEEL's FINISHED STEEL PRICE INDEX*

	Aug. 8 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.71	210.45	210.45	207.63	171.92
Index in cents per lb	6.114	5.701	5.701	5.625	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$137.75†	$131.27	$131.27	$127.41	$106.32
No. 2 Fdry Pig Iron, GT	62.63	61.09	60.84	58.99	52.54
Basic Pig Iron, GT	62.18	60.11	59.96	58.49	52.16
Malleable Pig Iron, GT	63.41	61.63	61.45	59.77	53.27
Steelmaking Scrap, GT	54.83	47.50	45.50	44.17	44.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

†Preliminary

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Aug. 8 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	4.65	4.65	4.65	3.70
Bars, H.R., Chicago	5.075	4.65	4.65	4.65	3.70
Bars, H.R., deld. Philadelphia	4.93	4.93	4.93	4.90	4.20
Bars, C.F., Pittsburgh	6.85*	6.25*	6.25*	5.90	4.55
Shapes, Std., Pittsburgh	5.00	4.60	4.60	4.60	3.65
Shapes, Std., Chicago	5.00	4.60	4.60	4.60	3.65
Shapes, deld. Philadelphia	5.00	5.00	5.00	4.88	3.91
Plates, Pittsburgh	4.85	4.50	4.50	4.50	3.70
Plates, Chicago	4.85	4.50	4.50	4.50	3.70
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.50	4.15
Plates, Sparrows Point, Md.	4.85	4.50	4.50	4.50	3.70
Plates, Claymont, Del.	5.35	5.35	5.35	4.50	4.15
Sheets, H.R., Pittsburgh	4.675	4.325	4.325	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.325	4.325	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.325	5.325	5.325	4.35
Sheets, C.R., Chicago	5.75	5.325	5.325	5.325	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	5.85	5.85	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.325	4.325	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.325	4.325	4.325	3.50
Strip C.R., Pittsburgh	6.85	6.25	6.25	6.317	4.65-5.35
Strip, C.R., Chicago	6.85	6.25-6.35	6.25-6.35	6.35-6.45	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	6.60	6.60	6.25	4.85-5.10
Nails, Wire, Pittsburgh	8.35	7.60	7.60	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.85	$9.85	$9.85	$9.05	$8.70

*Including 0.35c for special quality

SEMIFINISHED STEEL

Billets forging, Pitts. (NT)	$91.50	$84.50	$84.50	$84.50	$66.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	5.80	5.375	5.375	5.025	4.10-4.30

PIG IRON, Gross Ton

	Aug. 8 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$62.25	$62.25	$59.50	$53.00
Basic, Valley	62.50	60.00	60.00	58.50	52.00
Basic, deld. Phila.	66.26	66.26	63.76	62.16	56.49
No. 2 Fdry, Neville Island, Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	60.50	59.00	52.50
No. 2 Fdry, deld. Phila.	66.76	66.76	64.26	62.66	56.99
No. 2 Fdry, Birm.	59.00	57.00	57.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	62.70	62.70	62.70	55.33
Malleable, Valley	63.00	60.50	60.50	59.00	52.50
Malleable, Chicago	63.00	63.00	60.50	59.00	52.50
Ferromanganese, Duquesne	215.00†	215.00†	215.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

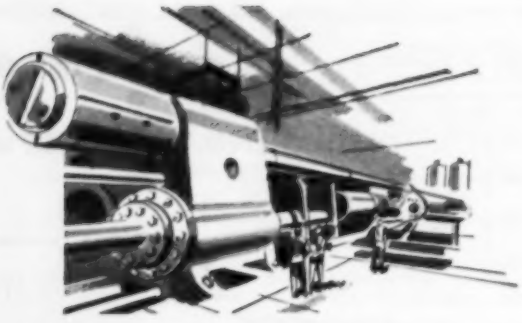
SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$55.50	$55.50	$43.50	$44.50	$45.00
No. 1 Heavy Melt, E. Pa.	55.00	54.00	47.00	46.00	43.50
No. 1 Heavy Melt, Chicago	54.00	50.00	46.00	42.00	43.50
No. 1 Heavy Melt, Valley	60.50	59.50	44.50	46.50	45.00
No. 1 Heavy Melt, Cleve.	57.50	56.50	42.50	44.00	44.00
No. 1 Heavy Melt, Buffalo	49.50	44.50	42.50	39.50	44.00
Rails, Rerolling, Chicago	75.50	73.50	67.50	64.50	52.50
No. 1 Cast Chicago	50.50	49.50	45.50	45.50	49.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.625	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.50	17.50

For longer life, higher performance in the petroleum, chemical and power industries



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CORPORATION • BUFFALO, NEW YORK

ELECTRONICS • NUCLEONICS • PLASTICS • METALLURGY • ULTRASONICS • AVIATION

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 150; to footnotes, page 152.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... *$74.00*

INGOTS, Alloy (NT)

Detroit R7 ..... $69.00
Houston 85 ..... 74.00
Midland,Pa. C18 ..... 69.00
Munhall,Pa. U5 ..... 69.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $65.50
Bessemer,Pa. U5 ..... *74.00*
Bridgeport,Conn. N19 .. 73.50
Buffalo R2 ..... *74.00*
Clairton,Pa. U5 ..... *74.00*
Ensley,Ala. T2 ..... *74.00*
Fairfield,Ala. T2 ..... *74.00*
Fontana,Calif. K1 ..... 82.50
Gary,Ind. U5 ..... *74.00*
Johnstown,Pa. B2 ..... *74.00*
Lackawanna,N.Y. B2 ..... *74.00*
LoneStar,Tex. L6 ..... 74.50
Munhall,Pa. U5 ..... *74.00*
Pittsburgh J5 ..... 68.50
S.Chicago,Ill. R2, U5 ..... *74.00*
S.Duquesne,Pa. U5 ..... *74.00*
Youngstown R2 ..... *74.00*

Carbon, Forging (NT)

Aliquippa,Pa. J5 ..... $84.50
Bessemer,Pa. U5 ..... *91.50*
Bridgeport,Conn. N19 .. 89.50
Buffalo R2 ..... *91.50*
Canton,O. R2 ..... *94.00*
Clairton,Pa. U5 ..... *91.50*
Conshohocken,Pa. A3 ..... *96.50*
Ensley,Ala. T2 ..... *91.50*
Fairfield,Ala. T2 ..... *91.50*
Fontana,Calif. K1 ..... 100.50
Gary,Ind. U5 ..... *91.50*
Geneva,Utah C11 ..... *91.50*
Houston 85 ..... 101.00
Johnstown,Pa. B2 ..... *91.50*
Lackawanna,N.Y. B2 ..... *91.50*
LosAngeles B3 ..... 94.00
Midland,Pa. C18 ..... 84.50
Munhall,Pa. U5 ..... *91.50*
Pittsburgh J5 ..... 84.50
Seattle B3 ..... 98.00
S.Chicago R2, U5 ..... *91.50*
S.Chicago W14 ..... *91.50*
S.Duquesne,Pa. U5 ..... *91.50*
S.SanFrancisco B3 ..... 94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..... *$107.00*
Buffalo R2 ..... *107.00*
Canton,O. R2 ..... *107.00*
Conshohocken,Pa. A3 ..... *114.00*
Detroit R7 ..... 96.00
Fontana,Calif. K1 ..... 127.00
Gary,Ind. U5 ..... *107.00*
Houston 85 ..... 105.00
Ind.Harbor,Ind. Y1 ..... 96.00
Johnstown,Pa. B2 ..... *107.00*
Lackawanna,N.Y. B2 ..... *107.00*
LosAngeles B3 ..... 116.00
Massillon,O. R2 ..... *107.00*
Midland,Pa. C18 ..... 96.00
Munhall,Pa. U5 ..... *107.00*
S.Chicago R2, U5 ..... *107.00*
S.Chicago W14 ..... *107.00*
S.Duquesne,Pa. U5 ..... *107.00*
Struthers,O. Y1 ..... 96.00
Warren,O. C17 ..... 106.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... *$111.50*
Canton,O. R2 ..... *114.00*
Cleveland R2 ..... *111.50*
Gary,Ind. U5 ..... *111.50*
S.Chicago R2 ..... *111.50*
S.Chicago W14 ..... *111.50*
S.Duquesne,Pa. U5 ..... *111.50*

SKELP

Aliquippa,Pa. J5 ..... 4.325
LoneStar,Tex. L6 ..... 4.625
Munhall,Pa. U5 ..... *4.625*
SparrowsPoint,Md. B2 ..... *4.625*
Warren,O. R2 ..... *4.625*
Youngstown R2, U5 ..... *4.625*

WIRE RODS

AlabamaCity,Ala. R2 ..... *5.80*
Aliquippa,Pa. J5 ..... 5.375
Alton,Ill. L1 ..... 5.55
Buffalo W12 ..... 5.375
Cleveland A7 ..... *5.80*
Donora,Pa. A7 ..... *5.80*
Fairfield,Ala. T2 ..... *5.80*
Houston 85 ..... 5.625
IndianaHarbor,Ind. Y1 .. 5.375
Johnstown,Pa. B2 ..... *5.80*
Joliet,Ill. A7 ..... *5.80*
KansasCity,Mo. 85 ..... 5.625
Kokomo,Ind. C16 ..... 5.475
LosAngeles B3 ..... 6.175
Minnequa,Colo. C10 ..... 5.625
Monessen,Pa. P7 ..... 5.375
N.Tonawanda,N.Y. B11 5.375
Pittsburg,Calif. C11 ..... *6.45*
Portsmouth,O. P12 ..... 5.725
Roebling,N.J. R5 ..... 5.475
S.Chicago,Ill. R2 ..... *5.80*
SparrowsPoint,Md. B2 ..... *5.90*
Sterling,Ill.(1) N15 ..... 5.375
Sterling,Ill. N15 ..... 5.475
Struthers,O. Y1 ..... 5.375
Worcester,Mass. A7 ..... *6.10*

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ..... *5.00*
Aliquippa,Pa. J5 ..... 4.60
Bessemer,Ala. T2 ..... *5.00*
Bethlehem,Pa. B2 ..... *5.05*
Birmingham C15 ..... 5.10
Clairton,Pa. U5 ..... *5.00*
Fairfield,Ala. T2 ..... *5.00*
Fontana,Calif. K1 ..... 5.75
Gary,Ind. U5 ..... *5.00*
Geneva,Utah C11 ..... *5.00*
Houston 85 ..... 4.70
Ind.Harbor,Ind. I-2 ..... *5.00*
Johnstown,Pa. B2 ..... *5.05*
KansasCity,Mo. 85 ..... 4.70
Lackawanna,N.Y. B2 ..... *5.05*
LosAngeles B3 ..... 5.30
Minnequa,Colo. C10 ..... 4.90
Munhall,Pa. U5 ..... *5.00*
Niles,Calif. P1 ..... 5.75
Phoenixville,Pa. P4 ..... *5.85*
Portland,Oreg. O4 ..... *5.80*
Seattle B3 ..... 5.35
S.Chicago W14 ..... *5.00*
S.Chicago,Ill. U5 ..... *5.00*
S.SanFrancisco B3 ..... 5.25
Torrance,Calif. C11 ..... *5.70*
Weirton,W.Va. W6 ..... 4.60

Wide Flange

Bethlehem,Pa. B2 ..... *5.05*
Clairton,Pa. U5 ..... *5.00*
Fontana,Calif. K1 ..... 5.90
IndianaHarbor,Ind. I-2 ..... *5.00*
Lackawanna,N.Y. B2 ..... *5.05*
Munhall,Pa. U5 ..... *5.00*
Phoenixville,Pa. P4 ..... *5.85*
S.Chicago,Ill. U5 ..... *5.00*

Alloy Std. Shapes

Clairton,Pa. U5 ..... *6.20*
Fontana,Calif. K1 ..... 7.85
Gary,Ind. U5 ..... *6.20*
Houston 85 ..... 5.75
Munhall,Pa. U5 ..... *6.20*
S.Chicago,Ill. U5 ..... *6.20*

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ..... 6.75
Bessemer,Ala. T2 ..... *7.35*
Bethlehem,Pa. B2 ..... *7.40*
Clairton,Pa. U5 ..... *7.35*
Fairfield,Ala. T2 ..... *7.35*
Fontana,Calif. K1 ..... 7.90
Gary,Ind. U5 ..... *7.35*
Geneva,Utah C11 ..... 6.75
Houston 85 ..... 6.85
Ind.Harbor,Ind. I-2, Y1 *7.35*
Johnstown,Pa. B2 ..... *7.40*
KansasCity,Mo. 85 ..... 6.85
Lackawanna,N.Y. B2 ..... *7.40*
LosAngeles B3 ..... 7.45
Munhall,Pa. U5 ..... *7.35*
Seattle B3 ..... 7.50
S.Chicago,Ill. U5 ..... *7.35*
S.Chicago W14 ..... *7.35*
S.SanFrancisco B3 ..... 7.40
Struthers, O. Y1 ..... 6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... *7.40*
Ind.Harbor,Ind. I-2 ..... *7.35*
Lackawanna,N.Y. B2 ..... *7.40*
Munhall,Pa. U5 ..... *7.35*
S.Chicago,Ill. U5 ..... *7.35*

PILING

BEARING PILES

Bethlehem,Pa. B2 ..... 4.65
Lackawanna,N.Y. B2 ..... 4.65
Munhall,Pa. U5 ..... *5.00*
S.Chicago,Ill. U5 ..... *5.00*

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ..... *5.90*
Lackawanna,N.Y. B2 ..... *5.90*
Munhall,Pa. U5 ..... *5.90*
S.Chicago,Ill. U5 ..... *5.90*

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... *4.85*
Aliquippa,Pa. J5 ..... 4.50
Ashland,Ky. (15) A10 .. 4.50
Bessemer,Ala. T2 ..... *4.85*
Bridgeport,Conn. N19 .. 4.75
Buffalo R2 ..... *4.85*
Clairton,Pa. U5 ..... *4.85*
Claymont,Del. C22 ..... 5.35
Cleveland J5, R2 ..... *4.95*
Coatesville,Pa. L7 ..... 4.80
Conshohocken,Pa. A3 ..... *4.90*
Detroit M1 ..... 4.60
Ecorse,Mich. G5 ..... 4.60
Fairfield,Ala. T2 ..... *4.85*
Fontana,Calif.(30) K1 .. 5.65
Gary,Ind. C11 ..... *4.85*
Geneva,Utah C11 ..... *4.85*
GraniteCity,Ill. G4 ..... 5.15
Harrisburg,Pa. P4 ..... *5.80*
Houston 85 ..... 4.60
Ind.Harbor,Ind. I-2, Y1 *4.85*
Johnstown,Pa. B2 ..... *4.85*
Lackawanna,N.Y. B2 ..... *4.85*
LoneStar,Tex. L6 ..... 4.85
Mansfield,O. E6 ..... 4.50
Minnequa,Colo. C10 ..... 5.35
Munhall,Pa. U5 ..... *4.85*
Newport,Ky. N9 ..... 4.90
Pittsburgh J5 ..... 4.50
Riverdale,Ill. A1 ..... 4.90
Seattle B3 ..... 5.40
Sharon,Pa. S3 ..... *4.85*
S.Chicago R2, U5 ..... *4.85*
S.Chicago W14 ..... *4.85*
SparrowsPoint,Md. B2 ..... *4.85*
Steubenville,O. W10 ..... *4.85*
Warren,O. R2 ..... *4.85*
Weirton,W.Va. W6 ..... 4.50
Youngstown R2, U5, Y1 *4.85*

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ..... 6.20
Fontana,Calif. K1 ..... 6.80
Geneva,Utah C11 ..... *6.00*
Johnstown,Pa. B2 ..... 5.65
SparrowsPoint,Md. B2.. 5.65

PLATES, Wrought Iron

Economy,Pa. B14 ..... 11.128

PLATES,High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.725
Bessemer,Ala. T2 ..... *7.25*
Clairton,Pa. U5 ..... *7.25*
Cleveland J5, R2 ..... *7.25*
Claymont,Del. C22 ..... 6.725
Coatesville,Pa. L7 ..... *7.55*
Conshohocken,Pa. A3 ..... *7.25*
Ecorse,Mich. G5 ..... 6.825
Fairfield,Ala. T2 ..... *7.25*
Fontana,Calif.(30) K1 .. 7.875
Gary,Ind. U5 ..... *7.25*
Geneva,Utah C11 ..... *7.25*
Houston 85 ..... 6.825
Ind.Harbor,Ind. I-2, Y1 *7.25*
Johnstown,Pa. B2 ..... *7.25*
Munhall,Pa. U5 ..... *7.25*
Pittsburgh J5 ..... 6.725
Seattle B3 ..... 7.625
Sharon,Pa. S3 ..... *7.25*
S.Chicago,Ill. U5 ..... *7.25*
S.Chicago W14 ..... *7.25*
SparrowsPoint,Md. B2 ..... *7.25*
Warren,O. R2 ..... *7.25*
Youngstown U5, Y1 ..... *7.25*

PLATES, Alloy

Bridgeport,Conn. N19 .. 6.55
Claymont,Del. C22 ..... 6.30
Coatesville,Pa. L7 ..... *6.85*
Fontana,Calif.(30) K1 .. 7.70
Gary,Ind. U5 ..... *6.85*
Houston 85 ..... 6.40
Ind.Harbor,Ind. Y1 ..... 6.30
Johnstown,Pa. B2 ..... *6.85*
Munhall,Pa. U5 ..... *6.85*
Newport,Ky. N9 ..... 7.00
Seattle B3 ..... 7.20
Sharon,Pa. S3 ..... *6.85*
S.Chicago,Ill. U5 ..... *6.85*
S.Chicago W14 ..... *6.85*
SparrowsPoint,Md. B2 .. *6.85*
Youngstown Y1 ..... 6.30

FLOOR PLATES

Cleveland J5 ..... 5.575
Conshohocken,Pa. A3 ..... *5.925*
Harrisburg,Pa. P4 ..... *6.275*
Ind.Harbor,Ind. I-2 ..... *5.925*
Munhall,Pa. U5 ..... *5.925*
S.Chicago,Ill. U5 ..... *5.925*

PLATES, Ingot Iron

Ashland c.l. (15) A10. 4.75
Ashland l.c.l. (15) A10 5.25
Cleveland c.l. R2 ..... 5.10
Warren,O. c.l. R2 ..... 5.10

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..... *5.075*
Aliquippa,Pa.(9) J5 ..... 4.90
Alton,Ill. L1 ..... 4.85
Atlanta(9) A11 ..... 5.15
Bessemer,Ala.(9) T2 ..... *5.075*
Birmingham C15 ..... 5.15
Bridgeport,Conn. N19 .. 4.80
Buffalo(9) R2 ..... *5.075*
Canton,O. R2 ..... *5.55*
Clairton,Pa. U5 ..... *5.075*
Cleveland(9) R2 ..... *5.075*
Ecorse,Mich.(9) G5 ..... 4.75
Emeryville,Calif. J7 ..... 5.40
Fairfield,Ala.(9) T2 ..... *5.075*
Fairless,Pa.(9) U5 ..... *5.225*
Fontana,Calif.(9) K1 .. 5.80
Geneva(9) C11 ..... *5.175*
Gary,Ind.(9) U5 ..... *5.075*
Houston(9) 85 ..... 4.90
IndHarbor,Ind.(9) I-2 ..... *5.075*
Ind.Harbor,Ind. Y1 ..... 4.65
Johnstown,Pa.(9) B2 ..... *5.075*
Joliet,Ill. P22 ..... 5.15
KansasCity,Mo.(9) 85 .. 4.90
Lackawanna(9) B2 ..... *5.075*
LosAngeles(9) B3 ..... 5.35
Massillon,O.(9) R2 ..... *5.075*
Midland,Pa.(9) C18 ..... 4.65
Milton,Pa. M18 ..... 5.25
Minnequa,Colo. C10 ..... 5.10
Niles,Calif. P1 ..... 5.85
N.Tonawanda,N.Y.(9) B11 4.65
Pittsburg,Calif.(9) C11 ..... *5.775*
Pittsburgh(9) J5 ..... 4.65
Portland,Oreg. O4 ..... *5.85*
Seattle B3, N14 ..... 5.40
S.Chicago W14 ..... *5.075*
S.Chicago,Ill.(9) R2, U5 *5.075*
S.Duquesne,Pa.(9) U5 ..... *5.075*
S.SanFran.,Calif.(9) B3 5.40
Sterling,Ill.(1) N15 ..... 4.65
Sterling,Ill. N15 ..... 4.75
Struthers,O. Y1 ..... 4.65
Torrance,Calif.(9) C11 ..... *5.775*
Warren,O.(9) R2 ..... *5.075*
Weirton,W.Va. (9) W6 4.65
Youngstown(9) R2, U5 ..... *5.075*

BARS, H.R. Loaded Alloy

Warren,O. C17 ..... 7.075

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... *6.125*
Bridgeport,Conn. N19 .. 5.725
Buffalo R2 ..... *6.125*
Canton,O. R2 ..... *6.125*
Clairton,Pa. U5 ..... *6.125*
Detroit R7 ..... 5.575
Ecorse,Mich. G5 ..... 5.675
Fairless,Pa. U5 ..... *6.275*
Fontana,Calif. K1 ..... 7.175
Gary,Ind. U5 ..... *6.125*
Houston 85 ..... 5.825
Ind.Harbor,Ind. I-2, Y1 *6.125*
Johnstown,Pa. B2 ..... *6.125*
KansasCity,Mo. 85 ..... 5.825
Lackawanna,N.Y. B2 ..... *6.125*
LosAngeles B3 ..... 6.625
Massillon,O. R2 ..... *6.125*
Midland,Pa. C18 ..... 5.575
S.Chicago R2, U5 ..... *6.125*
S.Chicago W14 ..... *6.125*
S.Duquesne,Pa. U5 ..... *6.125*
Struthers,O. Y1 ..... 5.575
Warren,O. C17 ..... 6.075
Youngstown U5 ..... *6.125*

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.80
Bessemer,Ala. T2 ..... *7.425*
Bethlehem,Pa. B2 ..... 6.80
Clairton,Pa. U5 ..... *7.425*
Cleveland R2 ..... *7.425*
Ecorse,Mich. G5 ..... 6.90
Fairfield,Ala. T2 ..... *7.425*
Fontana,Calif. K1 ..... 7.95
Gary,Ind. U5 ..... *7.425*
Houston 85 ..... 7.05
Ind.Harb.,Ind. Y1 ..... 6.80
Johnstown,Pa. B2 ..... 6.80
KansasCity,Mo. 85 ..... 7.05
Lackawanna,N.Y. B2 ... 6.80
LosAngeles B3 ..... 7.50
Pittsburgh J5 ..... 6.80
Seattle B3 ..... 7.55
S.Chicago W14 ..... *7.425*
S.Duquesne,Pa. U5 ..... *7.425*
S.SanFrancisco B3 ..... 7.55
Struthers,O. Y1 ..... 6.80
Warren,O. R2 ..... *7.425*
Youngstown U5 ..... *7.425*

BAR SIZE ANGLES, H.R. Carbon

Bethlehem,Pa.(9) B2 ..... *5.225*
Lackawanna(9) B2 ..... *5.075*

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5 ..... 4.65
Atlanta A11 ..... 5.15
Fontana,Calif. K1 ..... 5.35
Joliet,Ill. P22 ..... 5.10
Niles,Calif. P1 ..... 5.85
Pittsburgh J5 ..... 4.65
Portland,Oreg. O4 ..... *5.85*
SanFrancisco B7 ..... 5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... *6.20*
Gary,Ind. U5 ..... *6.20*
Houston 85 ..... 5.90
KansasCity,Mo. 85 ..... 5.90
Youngstown U5 ..... *6.20*

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ..... 8.325
Camden,N.J. P13 ..... 8.35
Chicago W18 ..... 8.325
Cleveland C20 ..... 8.325
Monaca,Pa. B17 ..... 8.325
Newark,N.J. W18 ..... 8.50
SpringCity,Pa. K3 ..... 8.30
Warren,O. C17 ..... 9.075

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ..... *6.85*
BeaverFalls,Pa. M12, R2 *6.85*
Buffalo B5 ..... *6.90*
Camden,N.J. P13 ..... *7.30*
Carnegie,Pa. C12 ..... 6.25
Chicago W18 ..... *6.85*
Cleveland A7 ..... *6.85*
Cleveland C20 ..... 6.25
Detroit B5 ..... *7.05*
Detroit R7 ..... 6.25
Donora,Pa. A7 ..... *6.85*
Elyria,O. W8 ..... 6.25
FranklinPark,Ill. N5 ..... *6.85*
Gary,Ind. U5 ..... *6.85*
GreenBay,Wis. F7 ..... 6.25
Hammond,Ind. L2, M13 6.25
Hartford,Conn. R2 ..... *7.35*
Harvey,Ill. B5 ..... *6.85*
LosAngeles(49) S30 ..... 7.70
LosAngeles R2 ..... *8.30*
Mansfield,Mass. B5 ..... *7.40*
Massillon,O. R2, R8 ..... *6.85*
Midland,Pa. C18 ..... 6.25
Monaca,Pa. S17 ..... 6.25
Newark,N.J. W18 ..... *7.30*
NewCastle,Pa.(17) B4 .. 6.25
Pittsburgh J5 ..... 6.25
Plymouth,Mich. P5 ..... 6.50
Putnam,Conn. W18 ..... *7.40*
Readville,Mass. C14 ..... 6.80
S.Chicago,Ill. W14 ..... *6.85*
SpringCity,Pa. K3 ..... 6.70
Struthers,O. Y1 ..... 6.25
Waukegan,Ill. A7 ..... *6.85*
Worcester,Mass. W19 .. 6.70
Youngstown F3, Y1 ..... 6.25

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 5.15

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ..... *8.325*
BeaverFalls,Pa. M12,R2 7.425
Bethlehem,Pa. B2 ..... 7.425
Buffalo B5 ..... *8.325*
Camden,N.J. P13 ..... *8.50*
Canton,O. T2 ..... 7.425
Carnegie,Pa. C12 ..... 7.425
Chicago W18 ..... *8.325*
Cleveland A7, C20 ..... 7.425
Detroit R7 ..... 7.425
Detroit B5 ..... *8.525*
Donora,Pa. A7 ..... 7.425
Elyria,O. W8 ..... 7.425
FranklinPark,Ill. N5 ..... *8.325*
Gary,Ind. U2 ..... 7.425
GreenBay,Wis. F7 ..... 7.425
Hammond,Ind. L2, M13 7.425
Hartford,Conn. R2 ..... 7.725
Harvey,Ill. B5 ..... *8.325*
Lackawanna,N.Y. B2 ... 7.425
LosAngeles B30 ..... 9.10
Mansfield,Mass. B5 ..... *8.625*
Massillon,O. R2, R8 ... 7.425
Midland,Pa. C18 ..... 7.425
Monaca,Pa. B17 ..... 7.425
Newark,N.J. W18 ..... *8.50*
Plymouth,Mich. P5 ..... 7.625
S.Chicago W14 ..... *8.325*
SpringCity,Pa. K3 ..... 7.60
Struthers,O. Y1 ..... 7.425
Warren,O. C17 ..... 7.925
Waukegan,Ill. A7 ..... 7.425
Worcester,Mass. A7 ... 7.725
Youngstown F3, Y1 ..... 7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... *5.075*
Atlanta A11 ..... 5.15
Birmingham C15 ..... 5.15
Buffalo R2 ..... *5.075*
Cleveland R2 ..... *5.075*
Ecorse,Mich. G5 ..... 4.75
Emeryville,Calif. J7 ..... 5.45
Fairfield,Ala. T2 ..... *5.075*
Fairless,Pa. U5 ..... *5.225*
Fontana,Calif. K1 ..... 5.80
Ft.Worth,Tex.(42) T4 .. 5.10
Gary,Ind. U5 ..... *5.075*
Houston 85 ..... 4.90

Ind.Harbor,Ind. 1-2, Y1 5.075
Johnstown,Pa. B2 5.075
Joliet,Ill. P22 5.15
KansasCity,Mo. S5 4.90
Lackawanna,N.Y. B2 5.075
LosAngeles B3 5.35
Milton,Pa. M18 5.25
Minnequa,Colo. C10 5.10
Niles,Calif. P1 5.85
Pittsburg,Calif. C11 5.775
Pittsburgh J5 4.65
Portland,Oreg. O4 5.85
SandSprings,Okla. S5 5.15
Seattle B3, N14 5.40
S.Chicago R2 5.075
S.Duquesne,Pa. U5 5.075
S.SanFrancisco B3 5.40
SparrowsPoint,Md. B2 5.075
Sterling,Ill.(1) N15 4.65
Sterling,Ill. N15 4.75
Struthers,O. Y1 4.65
Torrance,Calif. C11 5.775
Youngstown R2, U5 5.075

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2 6.15
KansasCity,Kans. S5 6.45
Lackawanna,N.Y. B2 6.17
Marion,O. P11 6.15
Pittsburgh U8 6.17
Seattle B3, N14 6.60
SparrowsPt. ½-1" B2 6.15
Williamsport,Pa. S19 6.65

RAIL STEEL BARS

Chicago Hts.(3) C2, I-2 5.075
Chicago Hts.(4) C2, I-2 5.075
Ft.Worth,Tex.(26) T4 5.10
Franklin,Pa.(3) P5 4.65
Franklin,Pa.(4) P5 4.65
JerseyShore,Pa.(4) J8 5.00
Marion,O.(3) P11 4.85
Moline,Ill.(3) R2 4.80
Tonawanda(3) B12 5.15
Tonawanda(4) B12 5.15
Williamsport,Pa.(3) S19 5.25

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 12.305
Economy,Pa.(D.R.) B1415.301
Economy(Staybolt) B14 15.676
McK.Rks.(S.R.) L5 11.50
McK.Rks.(D.R.) L5 16.00
McK.Rks.(Staybolt) L5 17.00

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 4.675
Allenport,Pa. P7 4.325
Ashland,Ky.(8) A10 4.325
Cleveland J5, R2 4.675
Coushohocken,Pa. A3 4.725
Detroit(8) M1 4.425
Dravosburg,Pa. U5 4.675
Ecorse,Mich. G5 4.425
Fairfield,Ala. T2 4.675
Fairless,Pa. U5 4.725
Fontana,Calif. K1 5.575
Gary,Ind. U5 4.675
Geneva,Utah C11 4.775
GraniteCity,Ill. G4 4.95
Ind.Harbor, Ind. 1-2, Y1 4.675
Lackawanna,N.Y. B2 4.675
Mansfield, O. E6 (37) 4.325
Munhall,Pa. U5 4.675
Newport,Ky.(8) N9 4.725
Niles,O. M21 4.325
Pittsburg,Calif. C11 5.375
Pittsburgh J5 4.325
Portsmouth,O. P12 4.725
Riverdale,Ill. A1 4.725
Sharon,Pa. S3 4.675
S.Chicago,Ill. W14 4.675
SparrowsPoint,Md. B2 4.675
Steubenville,O. W10 4.675
Warren,O. R2 4.675
Weirton,W.Va. W6 4.325
Youngstown U5, Y1 4.675

SHEETS, H.R., (19 ga. & Lighter)

Ala.City,Ala. R3 5.625
Niles,O. M21 5.325

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 7.75
Gary, Ind. U5 7.75
Ind.Harbor,Ind. Y1 7.20
Newport,Ky. N9 7.90
Youngstown Y1, U5 7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 6.90
Coushohocken,Pa. A3 6.95
Dravosburg,Pa. U5 6.90
Ecorse,Mich. G5 6.475
Fairfield,Ala. T2 6.90
Fairless,Pa. U5 6.95
Fontana,Calif. K1 7.625
Gary,Ind. U5 6.90
Ind.Harbor,Ind. 1-2, Y1 6.90
Lackawanna(35) B2 6.90
Munhall,Pa. U5 6.90
Pittsburgh J5 6.375
S.Chicago,Ill. U5 6.90
SparrowsPoint(16) B2 6.90
Warren,O. R2 6.90
Youngstown U5, Y1 6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 4.575
Ind.Harbor,Ind. 1-2 4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 5.325
Cleveland J5, R2 5.75
Coushohocken,Pa. A3 5.80
Dravosburg,Pa. U5 5.75
Detroit M1 5.325
Ecorse,Mich. G5 5.425
Fairfield,Ala. T2 5.75
Fairless,Pa. U5 5.80
Follansbee,W.Va. F4 5.325
Fontana,Calif. K1 7.075
Gary,Ind. U5 5.75
GraniteCity,Ill. G4 6.025
Ind.Harbor,Ind. 1-2, Y1 5.75
Lackawanna,N.Y. B2 5.75
Mansfield,O. E6 5.325
Middletown,O. A10 5.325
Newport,Ky. N9 5.925
Pittsburg,Calif. C11 6.70
Pittsburgh J5 5.325
Portsmouth,O. P12 5.925
SparrowsPoint,Md. B2 5.75
Steubenville,O. W10 5.75
Warren,O. R2 5.75
Weirton,W.Va. W6 5.325
Youngstown Y1 5.325

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 8.525
Dravosburg,Pa. U5 8.525
Ecorse,Mich G5 7.975
Fairless,Pa. U5 8.575
Fontana,Calif. K1 9.625
Gary,Ind. U5 8.525
IndianaHarbor,Ind. Y1 7.875
Lackawanna(37) B2 8.525
Pittsburgh J5 7.875
SparrowsPoint(18) B2 8.525
Warren,W.Va. W6 8.525
Weirton,W.Va. W6 7.875
Youngstown Y1 7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 5.825

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.20	6.45
Canton,O. R2	6.10	6.55
Dravosburg U5	6.65	
Fairfield T2	6.65	
Gary,Ind. U5	6.65	6.90
Ind.Harbor 1-2	6.65	6.90
Kokomo,Ind. C16	6.60	
MartinsFry. W10	6.65	
Pitts.,Calif. C11	6.85	
SparrowsPt. B2	6.65	

SHEETS, Culvert—Pure Iron

Gary,Ind. U5 6.35
Ind.Harbor,Ind. 1-2 6.90
MartinsFry,O. W10 6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 6.30†
Ashland,Ky. A10 5.85†
Canton,O. R2 6.30†
Dover,O. R1 6.30†
Dravosburg,Pa. U5 6.30†
Fairfield,Ala. T2 6.30†
Gary,Ind. U5 6.30†
GraniteCity,Ill. G4 6.65†
Ind.Harbor,Ind. 1-2 6.30†
Kokomo,Ind. C16 6.35†
MartinsFerry,O. W10 6.30*
Middletown,O. A18 5.85†
Pittsburg,Calif. C11 7.05*
Pittsburgh J5 5.85†
SparrowsPt.,Md. B2 6.30†
Warren,O. R2 6.30†
Weirton,W.Va. W6 5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 7.075

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 9.275
SparrowsPoint(39) B2 9.275

SHEETS, Galvannealed Steel

Canton,O. R2 6.25
Dravosburg,Pa. U5 6.70
Kokomo,Ind. C16 7.00

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland, Ky. A10 6.10
Middletown,O. A10 6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 6.70
Niles,O.(28) R2 6.70
Weirton,W.Va. W6 6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.50
Butler,Pa. A10 (type 2) 8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 5.90
Cleveland R2 6.325
Dravosburg,Pa. U5 6.325
Gary,Ind. U5 6.325
GraniteCity,Ill. G4 6.60
Ind.Harbor,Ind. 1-2 6.325
Middletown,O. A10 5.90
Niles,O. M21 5.90
Youngstown Y1 5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 7.75
Ind.Harbor,Ind. 1-2 8.175
Yorkville,O. W10 8.17

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 6.70
Mansfield,O. E6 6.25
Middletown,O. A10 6.25
Niles,O. M21 6.25
Weirton,W.Va. W6 6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 6.65

Key To Producers

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div, Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	*4.675*
Alliensport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	*4.675*
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	*4.675*
Conshohocken,Pa. A3	*4.725*
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	*4.675*
Fontana,Calif. K1	5.575
Gary,Ind. U5	*4.675*
Ind.Harbor,Ind. Y1	*4.675*
Johnstown,Pa. B2	*4.675*
Lackawanna,N.Y. B2	*4.675*
LosAngeles(25) B3	5.075
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	*5.425*
Riverdale,Ill. A1	4.725
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	*4.675*
S.Chicago,Ill. W14	*4.675*
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	*4.675*
Sterling,Ill.(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	*5.425*
Warren,O. R2	*4.675*
Weirton,W.Va. W6	4.325
Youngstown U5	*4.675*

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	9.65
Gary,Ind. U5	*7.75*
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.90
Sharon,Pa. S3	*7.75*
S.Chicago W14	*7.75*
Youngstown U5, Y1	*7.75*

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	*6.95*
Conshohocken,Pa. A3	*6.95*
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	*6.95*
Fontana,Calif. K1	8.025
Gary,Ind. U5	*6.95*
Houston S5	6.675
Ind.Harbor,Ind. Y-2, Y1	*6.95*
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	*6.95*
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	*6.95*
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	*6.95*
Warren,O. R2	*6.95*
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	*6.95*

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	*6.85*
Conshohocken,Pa. A3	*6.90*
Dearborn,Mich. D3	6.35
Detroit M1, P20	6.35
Detroit D2	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.70
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.90
NewBedford,Mass. R10	6.70
NewBritain(10) S15	*6.85*
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7	*7.30*
NewHaven,Conn. D2	7.30
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale,Ill. A1	6.95
Rome,N.Y. (32) R6	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	*6.85*
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	*7.40*
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	*14.55*
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.90	13.05	15.75
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.90	13.05	15.75
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle,Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
NewYork W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y. (32) R6	7.10	9.05	10.60	12.75	15.45
		9.35	10.90	13.05	15.75
Trenton,N.J. R5	...	...	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	14.80	18.15	....
Buffalo W12	...	...	14.80	....	....
FranklinPark,Ill. T6	...	...	15.15	18.50	22.35
Harrison,N.J. C18	...	...	14.80	18.15	22.00
NewYork W3	...	...	14.80	18.15	22.00
Trenton,N.J. R5	...	...	14.80	18.15	22.00
Worcester,Mass. W12	...	...	14.80	....	....
Worcester,Mass. A7, T6	...	...	14.80	18.15	22.00
Youngstown C8	...	...	15.15	18.50	22.35

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.85*
Riverdale,Ill. A1	6.35*
Warren,O. B9, T5	6.25*
Worcester,Mass. A7	6.80*
Youngstown C8	6.25*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	*6.975*

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	*5.10*
Youngstown U5	4.75

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	*11.00*	*12.05*	*13.05*
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	9.00	9.95	10.55	11.55	12.45
Niles,O. M21	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	*10.35*	*11.00*	*12.05*	*13.05*
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	9.30*	10.30*	10.80*	11.90*	....
IndianaHarbor,Ind. I-2	*9.20†*	*10.35**	*11.025**‡*	*12.075**‡*	....
Vandergrift,Pa. U5	*9.20*	*10.35**	*11.025**‡*	*12.075**‡*	*13.05**
Vandergrift,Pa. U5	...	*10.85†*	*11.525†‡*	*12.575†‡*	*13.55†‡*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	*14.05*	*14.60*	*15.10*	*16.15*
Brackenridge,Pa. A4	12.80	....	....	....
Buffalo U5	*14.05*	*14.60*	*15.10*	*16.15*
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-72	T-65	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	....	17.45	17.95	....
Vandergrift,Pa. U5	*15.90*	*16.90*	*18.50*	*19.00*	*19.50*	*14.05***
Warren,O. R2	....	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.30	$8.55	$8.95
Dravosburg,Pa. U5	8.30	8.55	8.95
Fairfield,Ala. T2	8.40	8.65	9.05
Fairless,Pa. U5	8.40	8.65	9.05
Fontana,Calif. K1	9.05	9.30	9.70
Gary,Ind. U5	8.30	8.55	8.95
GraniteCity,Ill. G4	8.40	8.65	9.05
IndianaHarbor,Ind. I-2, Y1	8.30	8.55	8.95
Niles,O. R2	8.30	8.55	8.95
Pittsburg,Calif. C11	9.05	9.30	9.70
SparrowsPoint,Md. B2	8.40	8.65	9.05
Weirton,W.Va. W6	8.30	8.55	8.95
Yorkville,O. W10	8.30	8.55	8.95

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.975	....	....
Niles,O. R2	6.975	7.175	7.375

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.60	$9.85
Dravosburg,Pa. U5	9.60	9.85
Fairfield,Ala. T2	9.70	9.95
Fairless,Pa. U5	9.70	9.95
Fontana,Calif. K1	10.35	10.60
Gary,Ind. U5	9.60	9.85
Ind.Har. Y1	9.60	9.85
Pitts.,Calif. C11	10.35	10.60
Sp.Pt.,Md. B2	9.70	9.95
Weirton,W.Va. W6	9.60	9.85
Yorkville,O. W10	9.60	9.85

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.40
Dravosburg,Pa. U5	7.40
Fairfield,Ala. T2	7.50
Fairless,Pa. U5	7.50
Fontana,Calif. K1	8.15
Gary,Ind. U5	7.40
GraniteCity,Ill. G4	7.50
Ind.Harbor,Ind. I-2, Y1	7.40
Niles,O. R2	7.40
Pittsburg,Calif. C11	8.15
SparrowsPoint,Md. B2	7.50
Weirton,W.Va. W6	7.40
Yorkville,O. W10	7.40

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gary,Ind. U5	6.65
GraniteCity,Ill. G4	7.25
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	*7.15*

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$9.10
Gary,Ind. U5	9.10
Yorkville,O. W10	9.10

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	*$10.65*

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.65

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	*7.20*
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.80
Bartonville,Ill. K4	6.70
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7, C20	*7.20*
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	*7.20*
Duluth,Minn. A7	*7.20*
Fairfield,Ala. T2	*7.20*
Fostoria,O.(24) S1	6.80
Houston S5	6.85
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	*7.20*
Joliet,Ill. A7	*7.20*
KansasCity,Mo. S5	6.85
Kokomo,Ind. C16	7.20
LosAngeles B3	7.55
Minnequa,Colo. C10	6.85
Monessen,Pa. P7	6.60
N.Tonawanda B11	6.60
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	*8.15*
Portsmouth,O. P12	7.10
Rankin,Pa. A7	*7.20*
S.Chicago,Ill. R2	*7.20*
S.SanFrancisco C10	7.55
SparrowsPoint,Md. B2	*7.30*
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.60
Waukegan,Ill. A7	*7.20*
Worcester,Mass. A7	*7.50*

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	*8.725*
Donora,Pa. A7	*8.725*
Duluth,Minn. A7	*8.725*
Fostoria,O. S1	7.95
Johnstown,Pa. B2	*8.725*
LosAngeles B3	8.85
Millbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P7, P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	*9.675*
Portsmouth,O. P12	8.60
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	*8.725*
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	*8.825*
Struthers,O. Y1	7.90
Trenton,N.J. A7	*9.025*
Waukegan,Ill. A7	*8.725*
Worcester,Mass. A7	*9.025*
Worcester J4, T6, W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	*8.40*
Donora,Pa. A7	*8.40*
Duluth,Minn. A7	*8.40*
Johnstown,Pa. B2	*8.40*
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P7, P16	7.60
NewHaven,Conn. A7	*8.70*
Palmer,Mass. W12	7.90
Pittsburg,Calif. C11	*9.35*
Portsmouth,O. P12	8.30
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	*8.40*
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	*8.50*
Struthers,O. Y1	7.60
Trenton,N.J. A7	*8.70*
Waukegan,Ill. A7	*8.40*
Worcester,Mass. A7	*8.70*

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	12.90
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	13.05
Minnequa,Colo. C10	12.30
Monessen,Pa. P6	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Palmer,Mass. W12	11.00
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	11.50
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80
Struthers,O. Y1	10.70

ROPE WIRE (A)

Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P7, P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P16	11.35
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.25
Baltimore T6	9.80
Boston T6	9.80
Buffalo W12	9.50
Cleveland A7	9.50
Crawfordsville,Ind. M8	9.50
Dover,O. G6	10.25
Fostoria,O. S1	9.50
FranklinPark,Ill. T6	9.60
Kokomo,Ind. C16	9.50
Massillon,O. R8	9.50
Milwaukee C23	9.70
Monessen,Pa. P7, P16	9.50
Pawtucket,R.I. N8	9.80
Riverdale,Ill. A1	9.60
Rome,N.Y. R6	9.50
Trenton,N.J. R5	9.80
Worcester A7, T6, W12	9.80

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	*167*
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W12	162
Cleveland A9	*171*
Crawfordsville,Ind. M8	154
Donora,Pa. A7	*167*
Duluth,Minn. A7	*167*
Fairfield,Ala. T2	*167*
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(20) M8	163
Johnstown,Pa. B2	*169*
Joliet,Ill. A7	*167*
KansasCity,Mo. S6	157
Kokomo,Ind. C16	169
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	*186*
Rankin,Pa. A7	*167*
S.Chicago,Ill. R2	*167*
SparrowsPt.,Md. B2	*169*
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	*171*

NAILS, Cut (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A1	*$9.30*
Wheeling,W.Va. W10	*9.30*

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	*167*
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	*167*
Duluth,Minn. A7	*167*
Fairfield,Ala. T2	*167*
Jack'ville,Fla.(20) M8	163
Johnstown,Pa. B2	*169*
Joliet,Ill. A7	*167*
Kokomo,Ind. C16	169
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	*186*
Rankin,Pa. A7	*167*
S.Chicago,Ill. R2	*167*
SparrowsPt.,Md. B2	*169*
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	*171*

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.45
Bartonville,Ill. K4	9.45
Buffalo W12	9.45
Crawfordsville,Ind. M8	9.55
Donora,Pa. A7	9.45
Duluth,Minn. A7	9.45
Jacksonville,Fla. M8	10.01
Johnstown,Pa. B2	9.45
Joliet,Ill. A7	9.45
Kokomo,Ind. C16	9.55
LosAngeles B3	10.24
Minnequa,Colo. C10	9.70
Pittsburg,Calif. C11	10.23
S.Chicago,Ill. R2	9.45
SparrowsPt.,Md. B2	9.55
Sterling,Ill. N15	9.35

Coil No. 4500 Stand.	
AlabamaCity,Ala. R2	$9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Crawfordsville,Ind. M8	9.85
Donora,Pa. A7	9.75
Duluth,Minn. A7	9.75
Jacksonville,Fla. M8	10.31
Johnstown,Pa. B2	9.75
Joliet,Ill. A7	9.75
Kokomo,Ind. C16	9.85
LosAngeles B3	10.55
Minnequa,Colo. C10	10.00
Pittsburg,Calif. C11	10.55
S.Chicago,Ill. R2	9.75
SparrowsPt.,Md. B2	9.85
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.80
Bartonville,Ill. K4	9.80
Buffalo W12	9.80
Crawfordsville,Ind. M8	9.90
Donora,Pa. A7	9.80
Duluth,Minn. A7	9.80
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	9.80
Joliet,Ill. A7	9.80
Kokomo,Ind. C16	9.90
LosAngeles B3	10.60
Minnequa,Colo. C10	10.05
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.80
SparrowsPt.,Md. B2	9.90
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	*187***
Aliquippa,Pa. J5	172‡
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	*187‡*
Duluth,Minn. A7	*187‡*
Fairfield,Ala. T2	*187‡*
Houston,Tex. S5	180**
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	*191**
Joliet,Ill. A7	*187‡*
KansasCity,Mo. S5	180**
Kokomo,Ind. C16	193‡
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	*207†*
Rankin,Pa. A7	*187‡*
S.Chicago,Ill. R2	*187***
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	*191**
Sterling,Ill.(1) N15	179††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	*181***
Aliq'ppa,Pa.9-14½ga.J5	165‡
Atlanta A11	188
Bartonville,Ill. K4	188
Crawfordsville,Ind. M8	188
Donora,Pa. A7	*181†*
Duluth,Minn. A7	*181†*
Fairfield,Ala. T2	*181†*
Houston,Tex. S5	167**
Jacksonville,Fla. M8	173
Johnstown,Pa.(43) B2	*185*
Joliet,Ill. A7	*181†*
KansasCity,Mo. S5	167**
Kokomo,Ind. C16	180†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P7	166††
Pittsburg,Calif. C11	*204†*
Rankin,Pa. A7	*181†*
S.Chicago,Ill. R2	*181***
Sterling,Ill.(1) N15	166††

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.50	16.55
Buffalo W12	14.50	....
Cleveland A7	14.50	....
Crawf'dsville M8	16.50	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.85	16.80
Johnstown B2	14.50	16.40*
Kokomo C16	15.10	16.65†
Minnequa, C10	14.85	16.55**
Palmer,Mass W12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05
Worcester A7	14.80	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	*8.10*	*8.50***
Aliquippa J5	7.40	7.925‡
Atlanta A11	7.60	8.20
Bartonville(48) K4	7.60	8.20
Buffalo W12	7.50	7.90†
Cleveland A7	*8.10*	....
Crawfordsville M8	7.60	8.20
Donora,Pa. A7	*8.10*	*8.50†*
Duluth,Minn. A7	*8.10*	*8.50†*
Fairfield T2	*8.10*	*8.50†*
Houston(48) S5	7.65	8.05**
Jacks'ville,Fla. M8	7.85	8.45
Johnstown B2(48)	*8.10*	*8.70**
Joliet,Ill. A7	*8.10*	*8.50†*
Kans.City(48) S5	7.65	8.05**
Kokomo C16	8.10	8.50
LosAngeles B3	8.45	9.65*
Minnequa C10	7.75	8.15**
Monessen P7(48)	7.40	8.00††
Palmer,Mass. W12	7.80	8.20†
Pitts.,Calif. C11	*9.05*	*9.45†*
Portsmouth,O. P12	8.60	....
Rankin,Pa. A7	*8.10*	*8.50†*
S.Chicago R2	*8.10*	*8.50***
S.SanFran. C10	8.35	8.75**
SparrowsPt. B2(48)	*8.20*	*8.80**
Str'ling(1)(48) N15	7.40	8.00††
Struth'rs,O.(48) Y1	7.50	8.00‡
Worcester,Mass. A7	*8.40*	*8.80†*

Based on zinc price of: *13.50c. †8c. ‡10c. ‡Less than 10c. ††12c. **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	*195*
Atlanta A11	178
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	*195*
Duluth,Minn. A7	*195*
Fairfield,Ala. T2	*195*
Jacksonville,Fla. M8	182
Joliet,Ill. A7	*195*
Houston S5	178
KansasCity,Mo. S5	178
Kokomo,Ind. C16	179
Minnequa,Colo C10	180
Pitts.,Calif. C11	199
S.Chicago R2	*195*
S.SanFran.Calif. C10	197
SparrowsPoint,Md. B2	*197*
Sterling,Ill.(1) N15	173

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2,	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	*169*
Johnstown,Pa. B2	167
Marion,O. P11	167
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S19	*175*

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts

Full-Size Body (cut thread)	
†⅛" x 6" and smaller	61
Larger than ⅛" diam. and all diams. longer than 6"	55
Under-Size Body (rolled thread; not nutted):	
½" x 6" and smaller.	61

†⅛" x 4" and smaller and shorter are not nutted.

Carriage, Machine & Lag Bolts, Hot Galvanized:

⅛" and smaller	42
Larger than ⅛" diam. and all diams. longer than 6"	32

Lag Bolts

All diams. & 6" and shorter	61
All diams. longer than 6"	55

Plow, Tap & Blank Bolts

⅛" x 6" and smaller.	61
Larger than ⅛" diam. and all diams. longer than 6"	55

Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:

All sizes	61

STOVE BOLTS, SLOTTED

(Nuts not attached; bulk)

⅛" to ¼" diam. incl., 3" or shorter:	
25,000 to 199,999 pieces	61
200,000 or more pieces	64
5/16" to ⅜" diam., incl., 3" or shorter:	
15,000 to 99,999 pieces	61
100,000 or more pieces	64
Longer than 3", any diam.:	
5000 to 99,999 pieces.	61
100,000 or more pieces	64

MACHINE SCREWS, SLOTTED (Bulk)

No. 2 to ¼" diam. incl.:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
5/16" to ⅜" diam. incl.:	
15,000 to 99,999 pieces	20
100,000 or more	27

CAP SCREWS

(New Std., hexagon head, upset, packages)

Bright:

6" and shorter:	
¼" through ½" diam.	34
5/8" & ¾" diam.	31
⅞", 1"	8
Longer than 6":	
¼" through ⅝" diam.	3
¾" through 1" diam.	+13

High Carbon, Heat-treated:

6" and shorter:	
¼" through ½" diam.	20
5/8" & ¾" diam.	16
⅞", 1"	+11
Longer than 6":	
¼" through ⅝" diam.	+23
¾" through 1" diam.	+41

(New Std. Hexagon head, upset, bulk)

Bright:

½" x 6" & smaller & shorter	49
5/8", ¾", ⅞" diam. x 6" & shorter	45
⅝", ¾", 1" x 6" & shorter	31

High Carbon, Heat-treated:

½" x 6" & smaller & shorter	41
5/8" x ¾" diam. & 6" & shorter	39
⅝", ¾", 1" x 6" & shorter	20

NUTS

Reg. & Heavy Square Nuts:	
All sizes	61
H.P. Reg. & Heavy Hex Nuts:	
⅝" & smaller	64
¾" to 1⅛" incl.	63
1¼" to 1½" incl.	65
1⅝" & larger	61
C.P. Reg. & Heavy Hex Nuts	
⅝" & smaller	64
¾" & larger	61
Semifinished & Finished Nuts	
⅝" & smaller	66
¾" & larger	63
Semifinished Slotted Reg. & Heavy Hex Nuts	
⅝" & smaller	58
¾" & larger	63
Hot Galvanized Nuts, all types	
1⅛" & smaller	44

(On above items, add 25% for less than case quantities)

MACHINE SCREW NUTS & STOVE BOLT NUTS (Bulk)

No. 2 to ⅝" incl., Square:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
No. 2 to ⅝" incl., Hex.:	
25,000 to 199,999 pieces	18
200,000 or more pieces	25

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.95

⅞-in. under..List less 32½

BOILER TUBES

Net base e.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.55	20.90
1¼	13	....	25.53	21.25
1½	13	24.24	28.22	23.50
1⅝	13	28.63	33.34	27.76
2	13	32.09	37.37	31.13
2¼	13	36.14	42.09	35.05
2½	12	39.23	45.67	38.05
2⅝	12	43.22	50.31	41.91
2¾	12	46.79	54.48	45.38
3	12	49.90	58.10	48.39

RAILWAY MATERIALS

RAILS	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	*5.075*	*4.975*	*5.025*	*6.00*
Easley,Ala. T2	*5.075*	*4.975*	....	*6.00*
Fairfield,Ala. T2	....	....	....	*6.00*
Gary,Ind. U5	*5.075*	*4.975*	*5.025*	....
Huntington,W.Va. W7	....	....	....	6.15
Indiana Harbor,Ind. I-2	*5.075*	*4.975*	*5.025*	....
Johnstown,Pa. B2	....	....	*...(16)*	*6.00*
Lackawanna,N.Y. B2	*4.975*	*5.075*	*...(16)*	*6.00*
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	*5.075*	*4.975*	....	....
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	*6.025*
Gary,Ind. U5	*6.025*
Ind.Harbor,Ind. I-2	*6.025*
Lackawanna,N.Y. B2	*6.025*
Minnequa,Colo. C10	6.625
Seattle B3	6.775
Steelton,Pa. B2	*6.025*
Torrance,Calif. C11	*6.175*

TRACK BOLTS, Untreated

Cleveland R2	12.15
KansasCity,Mo. S5	12.90*
Lebanon,Pa. B2	12.15
Minnequa,Colo. C10	12.15
Pittsburgh O3, P14	12.15
Seattle B3	12.65

*Treated

AXLES

Ind.Harbor,Ind. S13	7.50
Johnstown,Pa. B2	*8.10*

JOINT BARS

Bessemer,Pa. U5	*6.35*
Fairfield,Ala. T2	*6.35*
Ind.Harbor,Ind. I-2	*6.35*
Joliet,Ill. U5	*6.35*
Lackawanna,N.Y. B2	*6.35*
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	*6.35*

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	*8.775*
Ind.Harbor,Ind. I-2, Y1	*8.775*
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	*8.775*
Minnequa,Colo. C10	7.90
Pittsburgh J5	8.05
Seattle B3	8.55
S.Chicago,Ill. R2	*8.775*
Struthers,O. Y1	8.05
Youngstown R2	*8.775*

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.142 to 0.219 in.; for gage 0.142 and lighter, 5.30c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.35 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 12" and narrower.
(36) 24" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & Lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025"; 0.025" and heavier, 0.25c higher.
(41) 8.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(46) 6-7 Ga.
(49) 3½-in. and smaller rounds; 7.95c over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	4	....	10.5	....	13	....	14.5	....	14.5	....	14	....	16.5	....
Lorain, O. N3	*—2*	*+20*	*4.5*	*+14.25*	*7*	*+11.75*	*8.5*	*+10.25*	*8.25*	*+10.5*	*10.75*	*+8.5*	....	....
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	*0.5*	*+17.5*	*4.5*	*+14.25*	*7*	*+11.75*	*8.5*	*+10.25*	*8.5*	*+10.25*	*8.25*	*+10.5*	*10.75*	*+8*

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	16.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. F6	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless, Pa. N3	....	....	....	....	....	....	*10.5*	*—8.75*	*13.5*	*—4.75*	*16*	*—1.25*	*18.5*	*0.5*
Fontana, Calif. K1	....	....	....	....	....	....	6	+13.25	9	+9.25	11.5	+5.75	14	+4
Ind. Harbor, Ind. Y1	....	....	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	....	....	....	....	....	....	*12.5*	*—6.75*	*15.5*	*—2.75*	*18*	*0.75*	*20.5*	*2.5*
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+12.5	7.5	+18	+0.5	+25	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Youngstown R2, Y1	....	....	....	....	....	....	*12.5*	*+6.75*	*15.5*	*+2.75*	*18*	*0.75*	*20.5*	*2.5*

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	....	....	....
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless, Pa. N3	*19*	*1.5*	*19.5*	*2*	*21*	*2.75*	*21*	*2.75*	*11.5*	*+7.25*	*11.5*	*+7.25*
Fontana, Calif. K1	14.5	+3	15	+2.5	16.5	+1.75	16.5	+1.75	7	+11.75	7	+11.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	*21*	*3.5*	*21.5*	*4*	*24*	*4.75*	*21*	*4.75*	....	....	....	....
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sparrows Pt., Md. B2	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Borolline— Ingot	Slabs	Forging —Billets—	Seamless Tube	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	19.75	24.50	....	....	33.00	....	....	....	45.00	41.50
202	21.00	27.25	33.00	....	35.75	....	39.25	41.25	45.25	45.25
301	20.50	25.25	....	....	34.00	38.50	40.50	....	47.25	43.75
302	22.00	28.00	34.00	....	36.75	38.75	40.75	43.00	47.50	47.50
302B	21.75	28.25	35.25	....	40.25	38.75	40.75	43.00	50.00	50.00
303	....	28.50	37.00	....	....	41.75	43.75	....	....	....
304	23.25	29.25	36.00	....	39.75	41.00	43.00	45.75	50.25	50.25
304L	....	....	43.00	....	46.75	48.50	50.50	53.25	57.75	57.75
305	24.75	32.50	....	....	43.00	41.00	43.00	46.25	53.50	53.50
308	26.75	34.00	42.50	....	45.50	48.25	50.50	55.00	57.50	57.50
309	34.75	44.00	51.50	....	58.50	57.75	60.50	64.25	73.50	73.50
310	42.50	53.75	69.00	....	75.50	77.75	81.50	83.25	87.00	87.00
314	....	....	....	....	....	77.75	....	83.25	....	....
316	35.25	44.50	56.25	....	63.50	63.75	66.75	70.25	74.75	74.75
316L	....	....	62.75	....	70.00	71.25	74.25	77.75	82.25	82.25
317	43.00	54.50	70.00	....	81.50	79.75	83.50	86.25	93.25	93.25
321	28.25	35.75	42.25	....	48.75	48.00	50.25	54.50	60.00	60.00
18-8CbTa	32.75	42.00	50.25	....	58.25	56.25	59.00	63.75	73.00	73.00
403	....	....	30.75	....	....	34.50	36.25	38.75	....	....
405	18.75	24.50	28.50	....	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	....	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	....	31.50	33.00	....	....	....
420	....	32.25	33.00	....	40.25	38.00	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	....	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	....	32.00	33.50	....	....	....
431	....	27.25	35.50	....	....	39.75	41.75	43.50	....	....
446	....	....	37.75	....	56.75	42.75	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co., Washington Steel Corp.

Clad Steel

	Plates— Carbon Base 10%	20%	Sheets Carbon Base 20%
202	....	....	30.50
304	*54.60*	*61.50*	*52.50*
304-L	*57.20*	*64.65*	....
316	*58.70*	*66.65*	....
316-L	*65.70*	*74.25*	....
316-CB	*65.90*	*74.25*	....
321	*56.35*	*63.40*	*57.25*
347	*59.50*	*68.45*	*68.25*
405	*29.20*	*37.05*	....
410	*28.70*	*36.55*	....
430	*28.70*	*36.55*	....
Inconel	*52.50*	*68.45*	....
Nickel	*44.10*	*58.65*	....
Nickel, Low Carbon	*46.30*	*61.15*	....
Monel	*47.00*	*62.55*	....
*Copper**	....	....	*46.00*

	Strip, Carbon Base— Cold Rolled— 10%	Both Sides
Copper*	33.40	42.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.090
18.25	4.25	1	4.75	....	2.305-2.475
18	4	2	9	....	2.675-2.6775
18	4	2	....	....	1.765
18	4	1	....	....	1.690
13.75	3.75	2	5	....	2.245
13.5	4	3	....	....	1.865
9	3.5	....	....	....	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross tons, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
Alabama City, Ala. R2	*58.50*	....	....	....
Birmingham R2	*58.50*	*59.00‡*	....	....
Birmingham U8	....	59.00†	63.00	....
Woodward, Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.76	....	....
Buffalo District				
Buffalo H1, R2	*62.50*	*63.00*	*63.50*	*64.00*
Tonawanda, N.Y. W12	60.00	60.50	61.00	61.50
N. Tonawanda, N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	70.65	71.15	71.65	....
Rochester, N.Y., deld.	63.62	63.52	64.02	....
Syracuse, N.Y., deld.	64.12	64.62	65.12	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary, Ind. U5	*62.50*	....	*63.00*	....
S. Chicago, Ill. R2	*62.50*	....	*63.00*	....
S. Chicago, Ill. Y1	60.00	60.50	60.50	61.00
S. Chicago U5	*62.50*	....	*63.00*	*63.50*
S. Chicago, Ill. W14	62.50	....	63.00	63.50
Milwaukee deld.	64.50	65.30	65.30	65.80
Muskegon, Mich. deld.	....	69.65	69.65	....
Cleveland District				
Cleveland R2, A7	*62.50*	*63.00*	*63.00*	*63.50*
Akron, O., deld.	*65.25*	*65.75*	*65.75*	*66.25*
Mid-Atlantic District				
Bethlehem, Pa. R2	*64.50*	*65.00*	*65.50*	*66.00*
New York, deld		*69.01*	*69.50*	
Newark, deld.	*67.70*	*68.20*	*68.70*	*69.20*
Birdsboro, Pa. B10	64.50	65.00	65.50	66.00
Chester, Pa. P4	*64.50*	*65.00*	*65.50*	....
Philadelphia, deld.	*66.26*	*66.76*	*67.26*	....
Steelton, Pa. R2	*64.50*	*65.00*	*65.50*	*66.00*
Swedeland, Pa. A3	64.50	65.00	65.50	66.00
Philadelphia, deld.	66.26	66.76	67.26	67.76
Troy, N.Y. R2	62.00	62.50	63.00	63.50
Pittsburgh District				
Neville Island, Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.95
McKeesRocks, deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	....	64.76	64.76	65.29
Verona, Trafford, deld.	64.79	65.32	65.32	65.85
Brackenridge, deld.	65.10	65.60	65.60	66.13
Bessemer, Pa. U5	*62.50*	....	*63.00*	*63.50*
Clairton, Rankin, S. Duquesne, Pa. U5	*62.50*	....	....	....
Midland, Pa. C18	60.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard, O. Y1	....	....	60.50	....
Sharpsville, Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	60.50	61.00
Mansfield, O., deld.	64.90	....	65.40	65.90
Duluth I-3	62.50	63.00	63.00	63.50
Erie, Pa. I-3	62.50	63.00	63.00	63.50
Everett, Mass. E1	63.25	63.75	64.25	....
Fontana, Calif. K1	70.00	70.50	....	....
Geneva, Utah C11	*62.50*	*63.00*	....	....
GraniteCity, Ill. G4	61.90	62.40	62.90	....
Ironton, Utah C11	*62.50*	*63.00*	....	....
LoneStar, Texas L6	....	55.00*	....	....
Minnequa, Colo. C10	62.00	62.50	63.00	....
Rockwood, Tenn. T3	....	55.00‡	59.00	....
Toledo, O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	66.26	66.76	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
†Phos. 0.70-0.90; intermediate (Phos. 0.31-0.70%), $60
‡Phos. 0.70-0.90; intermediate (Phos. 0.31-0.69%), $56

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. I-3, J1	*71.50*
Buffalo H1	70.20

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$92.50
Keokuk, Iowa, Open-hearth & Fdry, (freight allowed K2)	97.00
Keokuk, O. H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	100.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood, Tenn. T3 (Phos. 0.035% max)	72.50
Steelton, Pa. B2 (Phos. 0.015% max)	*70.50*
Philadelphia, deld.	*74.05*
Troy, N.Y. R2 (Phos. 0.015% max)	*70.50*
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	*67.50*
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie, Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Neville Island, Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.§	H.R. Alloy 4140††‡		Carbon	Floor
Atlanta	7.97	8.76	9.83	....	8.05	8.11	...	10.07	....	8.28	8.45	10.25
Baltimore	7.74	8.60	9.00	....	8.20	8.20	8.73	8.99§	14.89	8.44	8.06	9.62
Birmingham	7.63‖	8.50‖	8.85‖	....	7.71	7.77	8.95	...	....	7.93	7.95	10.00
Boston	8.62	9.57	10.82	57.24	8.71	8.71	9.26	10.36	14.16	8.77	8.91	10.34
Buffalo	7.70	8.50	10.51	....	7.85	7.85	8.85	8.40	14.00	8.19	8.30	9.50
Chattanooga	7.78‖	8.69‖	8.60‖	....	7.86	7.92	8.45	...	....	8.13	8.10	9.82
Chicago	7.63	8.49	9.60	....	7.71	7.77	8.30	8.25	13.65	7.93	7.95	9.22
Cincinnati	7.75	8.48	9.60	....	7.95	8.01	8.54	8.65	13.90	8.40	8.24	9.47
Cleveland	7.63	8.49	9.45	....	7.81	7.83	8.36	8.50	13.71	8.26	8.12	9.39
Denver	8.95	10.31	11.73	....	9.10	9.10	...	9.82	17.87	8.95	9.10	10.50
Detroit	7.82	8.68	9.88	....	7.99	8.05	8.58	8.54	13.89	8.40	8.23	9.41
Erie, Pa.	7.58	8.74	9.45[10]	....	7.81	7.85	...	8.60[10]	....	8.15	7.80	9.29
Houston	7.85	8.75	10.49	....	8.15	8.25	...	9.95	14.00	8.20	8.00	9.20
Jackson, Miss.	7.96‖	8.77‖	9.22‖	....	7.94	8.09	8.62	...	....	8.25	8.27	9.94
Los Angeles	8.15	10.00	11.00	51.50	8.50	8.15	8.70	10.90	14.40	8.30	8.75	10.85
Milwaukee	7.72	8.58	9.69	....	7.80	8.86	8.39	8.44	13.74	8.10	8.04	9.31
Moline, Ill.	7.48	8.50	9.45	....	7.56	7.62	...	8.10	....	7.78	7.80	...
New York	8.28	9.13	10.13	56.13	8.73	8.66	9.21	10.27	14.07	8.61	8.71	10.00
Norfolk, Va.	7.35	...	...	....	7.80	7.85	...	9.95	....	8.10	7.60	9.10
Philadelphia	7.84	8.69	9.91	....	8.49	8.23	8.76	9.02	13.85	8.25	8.22	9.33
Pittsburgh	7.63	8.74	9.90	52.00	7.81	7.77	8.30	8.50	13.65	7.93	7.95	9.22
Portland, Oreg.	8.30	8.80	10.80	....	8.55	8.25	...	12.55	15.30	8.20	8.20	10.10
Richmond, Va.	7.85	...	9.99	....	8.45	8.45	8.80	10.00	....	8.76	8.15	9.35
St. Louis	7.92	8.78	9.89	....	8.00	8.06	8.59	8.79	13.94	8.33	8.24	9.51
St. Paul	7.83	8.78	9.80	....	7.91	7.97	...	8.70	....	8.13	8.15	9.42
San Francisco	8.20	9.65	10.65	51.65	8.35	8.15	8.70	11.45	14.40[9]	8.25	8.30	10.50
Seattle	8.75	10.50	10.90	49.60	8.90	8.60	9.15	12.25	14.75	8.50	8.50	10.70
Spokane, Wash.	9.20	11.40	11.40	....	9.40	9.10	9.65	12.75	15.90	9.00	9.00	11.70
Washington	8.31	10.42	...	....	8.99	8.74	...	9.90	....	9.02	8.64	11.10

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 25-cent bar quality extras; **¼-in. and heavier; ††as annealed; §42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2800 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [9]—400 to 999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Weight—
55,600 lbs.

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Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmuth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stephens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Ft. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $124.

Ladle Brick (per 1000)

Dry Pressed: Ainey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $96; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $230.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzels (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., $43; Luning, Nev., $43. ⅝-in. grains with fines: Baltimore, $69-40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-28.00
Brazilian iron ore, 68-69%	33.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$32.50-33.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, contracts, nominally $1.35-1.40, per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 48-47% $1.10-1.15. Spot cargoes, 10 to 15% higher.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 3:1 0	$52.00-53.50
48% 2.8:1	nom. 49.00-50.00
48% no ratio	39.00-40.00

South African Transvaal

48% no ratio	$35.00-36.00
44% no ratio	25.00-26.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.10

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.35-3.80
60-65%	3.50-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.i.f., Camden, N.J., e.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N.J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, $6.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb, drum frght, allowed	
Carlots	36.20
Ton lots	38.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	39.75-51.00†
Bronze, 5000-lb lots	61.25-65.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	59.25-62.25†
Phosphor-Copper, 5000-lb lots	67.00
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.75-33.00‡
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.65
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5⅛	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Birmingham, ovens	*$27.60*
Cincinnati, deld.	*32.51*
Buffalo, ovens	27.50
Camden, N. J., ovens	26.50
Detroit, ovens	27.50
Pontiac, deld.	29.15
Saginaw, deld.	30.73
Erie, Pa., ovens	27.50
Everett, Mass., ovens	
New England, deld.	*28.55
Indianapolis, ovens	*28.75*
Ironton, O., ovens	26.00
Cincinnati, deld.	28.59
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	*29.50*
Neville Island (Pittsburgh), Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
St. Louis, ovens	28.50
St. Paul, ovens	*28.50*
Chicago, deld.	*31.82*
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.05	$7.05	$7.05	$7.45
Bar Size Angles	6.90	6.90	6.90	7.30
Structural Angles	7.45	7.45	7.45	7.85
I-Beams	7.65	7.65	7.65	8.05
Plates	8.90	8.90	8.90	9.30
Sheets, H.R.	8.75	8.75	8.75	9.15
Sheets, C.R. (drawing quality)	9.10	9.10	9.10	9.45
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.50	26.50	26.50	30.46
Barbed Wire (†)	6.50	6.50	6.50	6.85
Merchant Bars	7.00	7.00	7.00	7.40
Hot-Rolled Bands	7.50	7.50	7.50	7.90
Wire Rods, Thomas Commercial No. 5	6.50	6.50	6.50	6.90
Wire Rods, O-H Cold Heading Quality No. 5	6.90	6.90	6.90	7.30
Bright Common Wire Nails	7.80	7.80	7.80	8.10

Oil Country Pipe: Mills withdrawn for remainder of the year.

†Per 82-lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00
Birmingham area	36.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

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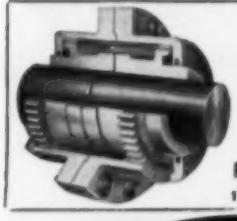

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Scrap Still on Uptrend

Prices continue to rise but at slower pace, with mill buying restricted pending resumption of full operations at various steel producing points

Scrap Prices, Page 160

Philadelphia — Prime grades of open-hearth scrap have been increased $1 a ton on the basis of what brokers must pay in covering old contracts. Momentarily, leading mills are studying the situation before making purchases. Dealers are holding back in anticipation of higher prices. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are $55, delivered. No. 2 heavy melting is unchanged at $46, but No. 2 bundles are up $1 to $44.

Light purchases have advanced electric furnace bundles $1 to $57, delivered, and low phos structurals and plate similarly to $58-$59. Borings and turnings, and railroad specialties are strong, but steady.

No. 1 cupola cast prices have advanced to $52-$53, delivered, as a result of small, scattered purchases at the outside figure. Malleable is higher at $67-$68, and drop broken, $57.

Chicago — An important mill here, reopening after the strike, has offered to buy certain grades of industrial scrap at prices $4 higher than a week previously. This offer, which is for No. 1 heavy melting at $56, No. 1 factory bundles at $57 and electric furnace material at $58 a gross ton, tends to slow the rapid rise of bids brokers have been making to dealers. Some bids are $2 to $3 above the mill's buying offer. There is some conjecture about how much scrap this mill will be able to acquire. During the strike, the three grades of scrap mentioned advanced $8 a ton.

Cleveland—While new buying is limited, following substantial mill purchases in the Valley a week ago, prices on the steel grades of scrap have advanced another $1 per ton in the Valley and Cleveland markets. Railroad grades are quoted $3 a ton higher. Cast iron grades have advanced $2 a ton on renewed foundry demand.

St. Louis — Brokers' buying prices are jumping. There is some business, but no large tonnages have been moved lately. A scrap shortage exists, and some mills need supplies. Rail grades are quoted $3 to $5 a ton higher. Charging box cast and heavy breakable cast are $2 higher.

Pittsburgh — Higher prices in neighboring areas are exerting pressure on the Pittsburgh market. Following stabilization of the No. 1 heavy melting price at $56, railroad scrap, cut structurals, punchings and plate scrap gained strength rapidly. Those grades are quoted $7 to $9 a ton higher than they were a week ago.

All railroad scrap grades increased $5 to $9 on the basis of latest lists. Turnings and borings

(*Please turn to page* 165)

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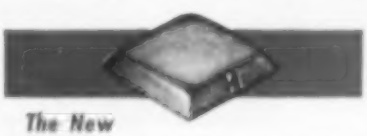

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Aug. 8	$54.83
Aug. 1	53.17
July Avg.	47.70
Aug. 1955	43.97
Aug. 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	55.00-56.00
No. 2 heavy melting	*48.00-49.00*
No. 1 bundles	55.00-56.00
No. 2 bundles	44.00-45.00
No. 1 busheling	55.00-56.00
Machine shop turnings	*36.00-37.00*
Mixed borings, turnings	*36.00-37.00*
Short shovel turnings	*40.00-41.00*
Cast iron borings	*40.00-41.00*
Cut structurals, 3 ft lengths	*66.00-67.00*
Heavy turnings	*48.00-49.00*
Punchings & plate scrap	*66.00-67.00*
Electric furnace bundles	*66.00-67.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Charging box cast	44.00-45.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt	*65.00-66.00*
Rails, 2 ft and under	*74.00-75.00*
Rails, 18 in. and under	*75.00-76.00*
Rails, random lengths	*68.00-69.00*
Railroad specialties	*70.00-71.00*

Stainless Steel Scrap

18-8 bundles & solids	*375.00-385.00*
18-8 turnings	255.00-270.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	*57.00-58.00*
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*57.00-58.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*57.00-58.00*
Machine shop turnings	32.50-33.50
Mixed borings, turnings	36.50-37.50
Short shovel turnings	36.50-37.50
Cast iron borings	36.50-37.50
Low phos.	*60.00-61.00*
Cut structural plates 2 ft and under	*66.00-67.00*
Alloy free, short shovel turnings	41.00-42.00
Electric furnace bundles	*60.00-61.00*

Cast Iron Grades

No. 1 cupola	*56.00-57.00*
Charging box cast	*42.00-43.00*
Heavy breakable cast	*46.00-47.00*
Stove plate	*53.00-54.00*
Unstripped motor blocks	*31.00-32.00*
Brake shoes	*41.00-42.00*
Clean auto cast	*56.00-57.00*
Burnt cast	*41.00-42.00*
Drop broken machinery	*57.00-58.00*

Railroad Scrap

No. 1 R.R. heavy melt	*62.00-63.00*
R.R. malleable	*63.00-64.00*
Rails, 2 ft and under	*75.00-76.00*
Rails, 18 in. and under	*77.00-78.00*
Rails, random lengths	*72.00-73.00*
Cast steel	*64.00-65.00*
Railroad specialties	*65.00-66.00*
Uncut tires	*65.00-66.00*
Angles, splice bars	*72.00-73.00*
Rails, rerolling	*74.00-75.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	380.00-390.00
18-8 turnings	250.00-260.00
430 clips, bundles, solids	100.00-110.00
430 turnings	50.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*60.00-61.00*
No. 2 heavy melting	*45.00-46.00*
No. 1 bundles	*60.00-61.00*
No. 2 bundles	*41.00-42.00*
No. 1 busheling	*60.00-61.00*
Machine shop turnings	34.00-35.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Low phos.	*63.00-64.00*
Electric furnace bundles	*63.00-64.00*

Railroad Scrap

No. 1 R.R. heavy melt	*64.00-65.00*

CHICAGO

No. 1 heavy melting	*52.00-56.00*
No. 2 heavy melting	*45.00-46.00*
No. 1 factory bundles	*56.00-57.00*
No. 1 dealer bundles	*51.00-54.00*
No. 2 bundles	*39.00-40.00*
No. 1 busheling	*52.00-56.00*
Machine shop turnings	*29.00-30.00*
Mixed borings, turnings	*31.00-32.00*
Short shovel turnings	*31.00-32.00*
Cast iron borings	*31.00-32.00*
Cut structurals, 3 ft	*60.00-61.00*
Punchings & plate scrap	*61.00-62.00*

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Stove plate	*46.00-47.00*
Unstripped motor blocks	*38.00-39.00*
Clean auto cast	*54.00-55.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
R.R. malleable	*65.00-66.00*
Rails, 2 ft and under	*75.00-76.00*
Rails, 18 in. and under	*76.00-77.00*
Angles, splice bars	*69.00-70.00*
Rails, rerolling	*75.00-76.00*

Stainless Steel Scrap

18-8 bundles & solids	*405.00-425.00*
18-8 turnings	*310.00-325.00*
430 bundles & solids	105.00-110.00
430 turnings	52.50-57.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*52.00*
No. 2 heavy melting	*41.00*
No. 1 bundles	*52.00*
No. 2 bundles	*39.00*
No. 1 busheling	*51.00*
Machine shop turnings	*29.00*
Mixed borings, turnings	*29.00*
Short shovel turnings	*32.00*
Punchings & plate scrap	*66.00*

Cast Iron Grades

No. 1 cupola	*48.00*
Charging box cast	*39.00*
Stove plate	*39.00*
Heavy breakable	*40.00*
Unstripped motor blocks	*26.00*
Clean auto cast	*53.00*
Malleable	*52.00*

BIRMINGHAM

No. 1 heavy melting	*42.00-43.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	*34.00-35.00*
No. 1 busheling	*42.00-43.00*
Cast iron borings	*23.00-24.00*
Short shovel turnings	29.00-30.00
Machine shop turnings	27.00-28.00
Electric furnace bundles	*51.00-52.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*51.00-52.00*
Stove plate	*49.00-50.00*
Bar Crops and plate	*55.00-56.00*
Structural & plate, 2 ft	*54.00-55.00*
Unstripped motor blocks	*41.00-42.00*
Charging box cast	*36.00-37.00*
No. 1 wheels	59.00-60.00

Railroad Scrap

No. 1 R.R. heavy melt.	*51.00-52.00*
Rails, 18-in. and under	*63.00-64.00*
Rails, rerolling	*68.00-69.00*
Rails, random lengths	*60.00-61.00*
Angles, splice bars	*60.00-61.00*

PHILADELPHIA

No. 1 heavy melting	*55.00*
No. 2 heavy melting	46.00
No. 1 bundles	*55.00*
No. 2 bundles	*44.00*
No. 1 busheling	*55.00*
Electric furnace bundles	*57.00*
Mixed borings, turnings	38.00
Machine shop turnings	37.00-38.00
Short shovel turnings	42.00
Heavy turnings	50.00
Structurals & plates	*58.00-59.00*
Couplers, springs, wheels	64.00
Rail crops, 2 ft & under	69.00-70.00

Cast Iron Grades

No. 1 cupola	*52.00-53.00*
Malleable	*67.00-68.00*
Heavy breakable cast	54.00
Drop broken machinery	*57.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*48.00-49.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*36.00-38.00*
Machine shop turnings	*28.00-29.00*
Mixed borings, turnings	*28.00-29.00*
Short shovel turnings	*33.0034.00*
Low phos. (structural & plate)	*50.00-52.00*

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Unstripped motor blocks	*35.00-36.00*
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips, solids	340.00-350.00
18-8 borings, turnings	170.00-180.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*51.00-51.50*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*51.00-51.50*
No. 2 bundles	*32.50-33.50*
No. 1 busheling	*51.00-51.50*
Machine shop turnings	24.00-24.50
Mixed borings, turnings	26.50-27.50
Short shovel turnings	28.00-29.00
No. 1 cast	43.00-43.50
Mixed cupola cast	38.50-39.00
No. 1 machinery cast	44.50-45.00

BUFFALO

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*36.00-37.00*
No. 1 busheling	*49.00-50.00*
Mixed borings, turnings	*34.00-35.00*
Machine shop turnings	*31.00-32.00*
Short shovel turnings	*35.00-36.00*
Cast iron borings	*34.00-35.00*
Low phos.	*56.00-57.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	49.00-50.00

Railroad Scrap

Rails, random lengths	*58.00-59.00*
Rails, 3 ft and under	*64.00-65.00*
Railroad specialties	50.00-51.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	52.50-53.50
No. 2 heavy melting	44.50-45.50
No. 1 bundles	52.50-53.50
No. 2 bundles	40.50-41.50
No. 1 busheling	52.50-53.50
Machine shop turnings	32.50-33.50
Mixed borings, turnings	34.50-35.50
Short shovel turnings	36.50-37.50
Cast iron borings	34.50-35.50
Low phos., 18 in.	54.00-55.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	46.00-47.00
Charging box cast	46.00-47.00
Drop broken machinery	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt	*54.00-55.00*
Rails 18 in. and under	*70.50-71.50*
Rails random lengths	*62.00-63.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	42.00
No. 2 heavy melting	40.00
No. 1 bundles	46.00
No. 2 bundles	36.00
No. 1 busheling	46.00
Machine shop turnings	26.00
Short shovel turnings	*36.00*

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	*42.00*
Heavy breakable cast	*42.00*
Unstripped motor blocks	39.00
Brake shoes	49.50
Clean auto cast	50.00
Stove plate	40.00

Railroad Scrap

No. 1 R.R. heavy melt.	*59.00*
Rails, 18 in. and under	*72.00*
Rails, random lengths	*70.00*
Rails, rerolling	*78.00*
Angles, splice bars	*70.00*

SEATTLE

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	39.00-40.00
No. 2 bundles	30.00-31.00
No. 3 bundles	20.00
Machine shop turnings	23.00-25.00
Mixed borings, turnings	23.00-25.00
Electric furnace No. 1	52.00-54.00

Cast Iron Grades

No. 1 cupola	42.00-45.00
Heavy breakable cast	36.00-38.00
No. 1 wheels	37.00
Unstripped motor blocks	40.00
Stove plate (f.o.b. plant)	30.00-31.00
Brake shoes	38.00

Railroad Scrap

Rails, random lengths	43.00-44.00

LOS ANGELES

No. 1 heavy melting	41.00
No. 2 heavy melting	37.00
No. 1 bundles	40.00
No. 2 bundles	30.00
Machine shop turnings	21.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00

SAN FRANCISCO

No. 1 heavy melting	43.00
No. 2 heavy melting	40.00
No. 1 bundles	42.00
No. 2 bundles	35.00
Machine shop turnings	20.00-23.00
Mixed borings, turnings	20.00-23.00
Cast iron borings	20.00-23.00
Heavy turnings	20.00-23.00
Short shovel turnings	25.00
Cut structurals	45.00
Punchings & plate scrap	44.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	42.00
Stove plate	39.00
Heavy breakable cast	39.00
Unstripped motor blocks	38.00
Brake shoes	35.00
Clean auto cast	48.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	40.00
No. 2 bundles	35.50
Mixed steel scrap	37.00
Busheling, new factory: Prepared	41.00
Unprepared	37.00
Short steel turnings	20.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., shipping point.

LOGEMANN

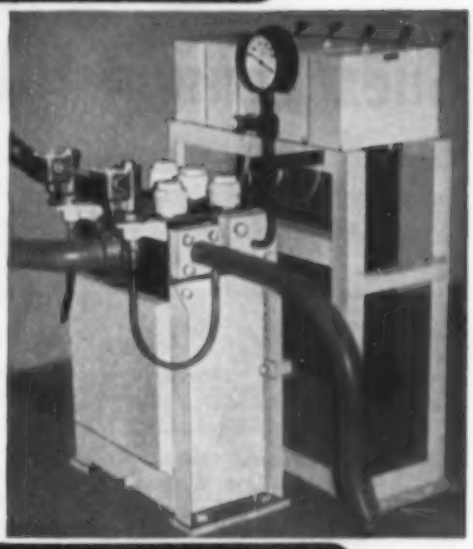
LOGEMANN Metal Balers

. . . powerful . . . compact . . . capable of high tonnage output!

In the large stamping plants and rolling mills where it is critically important that trim and stamping skeletons are quickly disposed of to avoid interference with production, LOGEMANN metal balers are relied on to keep ahead of production and pack such scrap into high density, self-cohering bricks for re-melting.

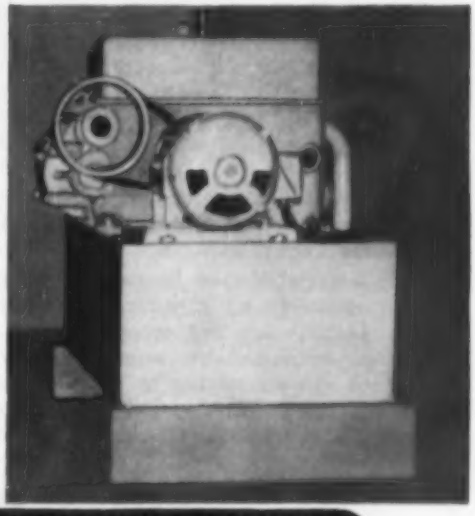
Hundreds of installations have established new records for tonnage, minimum maintenance, reliability, over extended periods of uninterrupted operation at high-speed.

LOGEMANN models are not confined to the large sizes. Many small plants have found it profitable to use smaller sizes embodying the same features of reliability, at minimum operating cost. Interested parties are invited to write for details. Information as to the character of the scrap, tonnage to be handled in a given period of hours, and range of gauges is helpful in determining the proper model.



HYDRAULIC VALVES

The illustration shows a close-coupled hydraulic valve, operated by compressed-air cylinders for high-speed distribution of large gallonage of fluid at high pressure. LOGEMANN engineers have designed and built valves for many unusual as well as standard applications, and will welcome inquiries, with an outline of the conditions and requirements.



HYDRAULIC PUMPS

The opposed-cylinder close-coupled double pressure pump shown in the illustration is mounted on an individual tank to conserve floor space under present crowded plant and operating conditions. When requesting details, please indicate the nature of the service, pressure and gallonage requirements, and the fluid to be handled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Suez Tension Hits Metals

Return of a strong nonferrous market is caused by increased European demand and the hassel for control of the Suez Canal. Barter program adds complications

Nonferrous Metal Prices, Pages 164 & 165

FOUR nonferrous metals (lead, zinc, copper and tin) are feeling the effects of: 1. Tension over Egypt's seizure of the Suez Canal. 2. Increased European demand.

Lead—The London Metal Exchange quotation last Wednesday was 14.72 cents a pound (asking price). Adding freight charges of 1 to 1.5 cents a pound would place shipments of foreign lead to this country on parity with the U. S. St. Louis price of 15.80 cents a pound. As business continues to surge back in Europe after a second-quarter drop, foreign companies which have been dipping deeply into inventories are placing orders for substantial tonnages.

Lead demand in this country continues to improve. Sales to the construction industry, cable makers and ammunition manufacturers are helping to beef up tonnage statistics. Battery makers are showing more interest, but have not entered the market in force.

Zinc—Foreign demand is good. While diecasters and galvanizers in this country have not ordered large new tonnages this month, Europeans are scrambling to rebuild depleted inventories. Suez tension is a motivating force, too.

Question of the week: Is the U. S. barter program—trading agricultural products for lead and zinc which goes to the U. S. supplemental stockpile—scaring continental buyers into purchasing both metals to refill sagging inventories rather than follow their recent pattern of buying on a day-by-day basis?

Copper—The LME asking quotation on Wednesday was 39.75 cents a pound. Custom smelters initiated four price hikes in the last ten days to bring their quotation to 39.50 cents a pound. Demand from Germany, Italy and France is buoying foreign sales.

Domestic copper shipments to utility and cable producers are heading for record totals. Condenser tubing sales are high. One soft spot: Foreign competition and high inventories are keeping users of water tubing away from the market.

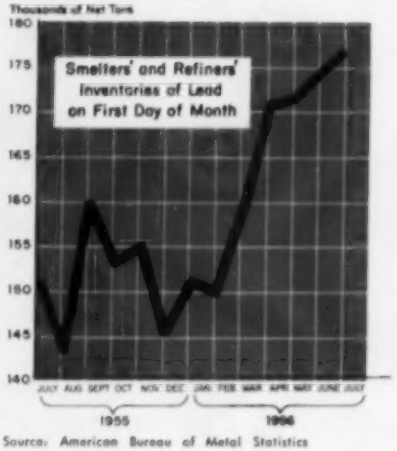
Tin—The Suez scare and strike threats have kept tin prices hovering near the $1 a pound mark. The Malayan workers are back on their jobs. A threatened Nigerian strike (Aug. 13) is subsiding.

Point of interest: The U. S. Texas City tin smelter closed its production lines during all of July. Reasons: 1. Lack of material. 2. Uncertainty of operations. Production has been resumed this month and is slated to continue until Jan. 31, 1957.

Thoughts on Aluminum

Aluminum prices (pig, 24.00 cents a pound; ingot, 25.90 cents a pound) will rise as soon as the strike is settled. Some people point out that the conservative price boost by the major steel companies may have a decided effect on how much aluminum producers will jack prices. Says one observer: "There's little doubt that we need more than a 1 cent a pound increase to offset the labor contract agreement reached with the Aluminum Workers International Union. A 1 cent a pound increase would cover only the direct wage boosts." Look for prices to rise 1.5 cents a pound.

Build-Up



Source: American Bureau of Metal Statistics

Market Memo

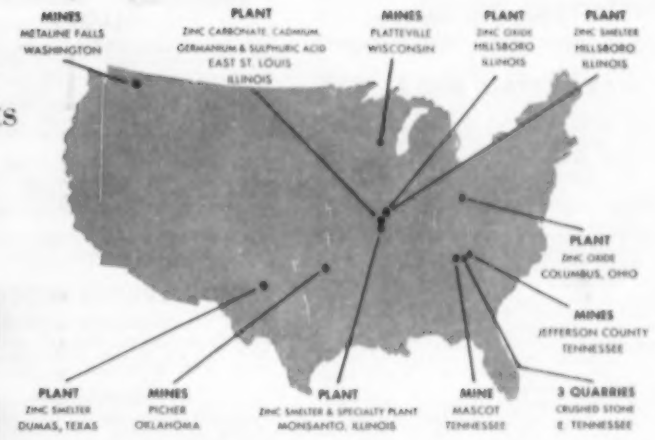
• Titanium producers are wondering how to catch up with skyrocketing orders. While ingots were produced during the steel strike, fabricating facilities manned by United Steelworkers ground to a halt. With most order books filled through the end of the fourth quarter, it means that titanium mills will be going full blast to meet shipment deadlines through the end of the year.

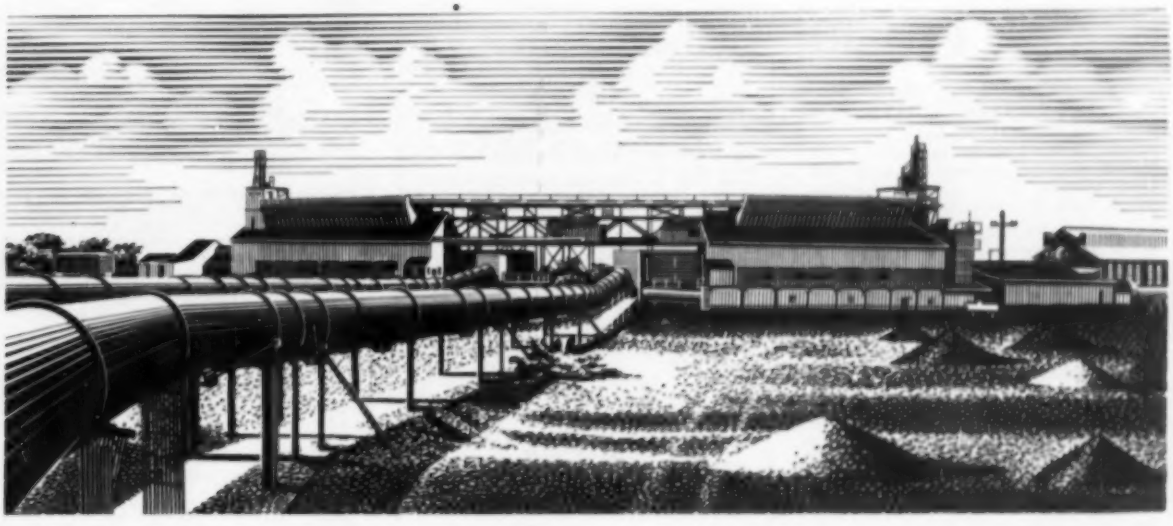
NONFERROUS PRICE RECORD

	Aug. 8 Price	Last Change		Previous Price	July Avg.	June Avg.	Aug. 1955 Avg.
Copper	39.75-40.00	Aug.	7, 1956	39.50-40.00	40.030	43.000	37.759
Lead	15.80	Jan.	13, 1956	16.30	15.800	15.800	14.800
Zinc	13.50	Jan.	6, 1956	13.00	13.500	13.500	12.500
Tin	99.25	Aug.	1, 1956	100.25	96.435	94.611	98.519
Nickel	64.50	Nov.	24, 1954	60.00	64.500	64.500	64.500
Aluminum	25.90	Mar.	29, 1956	24.40-25.90	25.900	25.900	24.267
Magnesium	33.75	Apr.	16, 1956	32.50	33.750	33.750	30.574

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

American Zinc and its products *from* A to Z





DUAL OPERATION AT HILLSBORO, ILLINOIS

(1) The Oxide Division supplies American process lead-free and leaded zinc oxide, as well as French process zinc oxide. (2) In the Metal Division, Prime Western, Select, Brass Special, Intermediate and High Grade slab zinc are produced. For complete picture of American Zinc operations, see map above.

PRODUCERS OF

ALL GRADES OF SLAB ZINC
ZINC ANODES (Plating & Galvanic)
METALLIC CADMIUM
SULPHURIC ACID
LEAD-FREE and LEADED ZINC OXIDES
ZINC CARBONATE
GERMANIUM DIOXIDE
AGRICULTURAL LIMESTONE
CRUSHED STONE

Distributors for

American Zinc sales Company

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, Ohio • Chicago • St. Louis • New York • Detroit • Pittsburgh

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 25.90; pigs, 24.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.70; No. 43, 27.50; No. 195, 29.30; No. 214, 29.30; No. 356, 27.70. 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. Reading, Pa., or Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 40.00 deld. Conn. valley; 40.00 deld. Midwest; custom smelters, 39.75 deld.; lake, 40.00 deld.; fire refined, 39.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 23.75; ingot, 24.50, f.o.b. Velasco, Tex.

Magnesium Alloys: AZ91B (diecasting), 35.00 deld.; AZ63A, AZ92A, AZ91C (sand castings), 39.25, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced, $3.20 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$110 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 90.50 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 99.00.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.00; grade A-2 (0.5% Fe max), $2.70 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom, f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 14.00; brass special, 14.25; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.60 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.50-28.25; No. 12 foundry alloy (No. 2 grade), 26.50-27.00; 5% silicon alloy, 0.60 Cu max, 28.25-28.50; 13 alloy, 0.60 Cu max, 28.50; 195 alloy, 28.75-29.00; 108 alloy, 27.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.00, grade 2, 26.25; grade 3, 25.50; grade 4, 25.00.

Brass Ingot: Red brass, No. 115, 37.55; tin bronze, No. 225, 48.00; No. 245, 43.50; high-leaded tin bronze, No. 305, 41.00; No. 1 yellow No. 405, 29.75; manganese bronze, No. 421, 33.00.

Magnesium Alloy Ingot: AZ63A, 36.00; AZ91B, 36.00; AZ91C, 36.00; AZ92A, 36.00.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.92; rod, bar, wire, $1.89.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 45.355; l.c.l., 45.98. Weatherproof, 30,000-lb lots, 43.78; l.c.l., 44.53. Magnet wire deld., 15,000 lb or more, 52.65; l.c.l., 53.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheet and strip, $12.10-$13.00; sheared mill plate, $10.50-$12.00; wire, $9.50-11.50; forging billets, $7.25-$7.50; hot-rolled and forged bars, $7.55-$7.80.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $22; H.R. strip $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	69.4	67.9	...	...
0.156-0.172	59.0	57.4	...	...
0.188	59.0	57.4	...	73.2
0.219-0.234	56.0	54.4	...	...
0.250-0.281	56.0	54.4	...	69.9
0.313	56.0	54.4	...	66.7
Cold-finished				
0.375-0.547	54.9	52.9	65.2	62.8
0.563-0.688	54.9	52.9	62.1	59.0
0.750-1.000	53.6	51.6	56.9	55.7
1.063	53.6	51.6	...	53.8
1.125-1.500	51.6	49.7	55.1	53.8
Rolled				
1.563	50.3	48.4	...	...
1.625-2.000	49.7	47.7	...	52.0
2.125-2.500	48.5	46.5	...	...
2.563-3.375	47.1	45.1	...	...

ALUMINUM (continued)

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	39.0	43.8	...	...
0.135-0.096	39.5	44.7	37.5	42.4
0.095-0.077	40.2	45.7	37.6	42.8
0.076-0.061	40.8	46.6	37.8	43.0
0.060-0.048	41.4	47.1	38.2	43.5
0.047-0.038	41.9	48.0	38.7	43.9
0.037-0.030	42.3	48.5	39.1	44.6
0.029-0.024	42.9	49.0	39.4	45.1
0.023-0.019	43.7	50.5	40.3	46.0
0.018-0.017	44.5	...	40.9	46.9
0.016-0.015	45.4	...	41.7	48.1
0.014	46.4	...	42.7	49.4
0.013-0.012	47.6	...	43.4	50.4
0.011	48.6	...	44.6	52.0
0.010-0.9095	49.9	...	45.8	53.7
0.009-0.0085	51.2	...	47.3	55.8
0.008-0.0075	52.8	...	48.5	57.6
0.007	54.3	...	50.0	59.9
0.006	55.9	...	51.4	64.9

*48 in. max diam. †26 in. max diam.

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	38.0	42.3
5050-F	39.1	43.4
3004-F	40.1	45.3
5052-F	41.4	46.7
6061-T6	42.6	47.5
2024-T4*	45.1	51.4
7075-T6*	52.9	60.0

*24-48 in. widths or diam, 72-180 lengths.

Forging Stock: Round, Class 1, 40.60-51.60 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 44.50-57.70 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, 20-ft length, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size(in.)		Nom. Pipe Size(in.)	
⅜	$17.45	2	$ 53.85
1	27.35	4	148.60
1¼	37.05	6	266.55
1½	44.30	8	401.10

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6061-T6	Alloy 6062-T6
9-11	43.50-45.00	58.80-62.90	58.36-62.40
12-14	43.80-45.20	59.50-63.80	59.00-63.30
15-17	44.00-45.70	60.70-65.40	60.26-64.90
18-20	44.50-46.20	62.60-67.80	62.10-67.30

MAGNESIUM

Sheet and Plate: AZ31A standard grade, 0.32 in., 160.00; 0.81 in., 75.00; .125 in., 68.00; .188 in., 66.50; .250-2.0 in., 65.60. AZ31A special grade, .032 in., 163.10; .080 in., 103.50; .250-2.0, 88.90. Tread plate, .188 in., 68.90; .250-2.0 in., 67.80. Tooling plate, .250-3.0 in., 70.20.

Extruded Solid Shapes:

Factor	Com. Grade (FS)	Spec. Grade (AZ31B)
6-8	66.40-69.00	81.40-84.00
12-14	67.50-69.60	82.50-84.60
24-26	72.10-72.70	87.10-87.70
36-38	84.90-85.80	99.90-100.80

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 18.00-19.00; old sheets, 18.00-19.00; borings and turnings, 9.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	61.63b	58.86c	....	61.82	36.000	36.000	35.250
Yellow Brass	52.10	42.65d	52.64	55.01	27.250	27.000	25.125
Low Brass, 80%	55.85	55.79	56.39	58.66	30.625	30.375	29.875
Red Brass, 85%	57.19	57.13	57.73	60.00	31.875	31.625	31.125
Com. Bronze, 90%	59.08	59.02	59.62	61.64	33.125	32.875	32.375
Manganese Bronze	59.46	53.56	63.80	....	25.250	25.000	24.500
Muntz Bronze	53.84	49.65	....	....	25.625	25.375	24.875
Naval Brass	55.72	50.03	62.78	58.88	25.250	25.000	24.500
Silicon Bronze	65.22	64.41	65.26	67.26e	35.000	34.750	34.000
Nickel Silver, 10%	67.76	70.09g	70.99	....	32.750	32.500	16.375
Phos. Bronze, A, 5%	79.58	80.08	80.08	81.26	36.250	36.000	35.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

10.00; crankcases, 15.00-16.00; industrial castings, 15.00-16.00.

Copper and Brass: No. 1 heavy copper and wire, 32.50-33.00; No. 2 heavy copper and wire, 30.00-30.50; light copper, 27.50-28.00; No. 1 composition red brass, 25.50-26.00; No. 1 composition turnings, 24.50-25.00; yellow brass turnings, 15.00-15.50; new brass clippings, 23.00-23.50; light brass, 15.00-15.50; heavy yellow brass, 17.00-17.50; new brass rod ends, 20.50-21.00; auto radiators, unsweated, 19.00-19.50; cocks and faucets, 19.50-20.00; brass pipe, 21.50-22.00.

Lead: Heavy, 12.50-13.00; battery plates, 7.00-7.25; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 14.50.

Monel: Clippings, 55.00-85.00; old sheets, 55.00-75.00; turnings, 60.00-70.00; rods, 55.00-85.00.

Nickel: Sheets and clips, 120.00-190.00; rolled anodes, 120.00-190.00; turnings, 100.00-150.00; rod ends, 120.00-190.00.

Zinc: Old zinc, 4.50-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 2.50-3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 20.50-21.00; 3003 clippings, 20.50-20.75; 6151 clippings, 20.50-20.75; 5052 clippings, 20.50-20.75; 2014 clippings, 19.50-20.25; 2017 clippings, 19.50-20.25; 2024 clippings, 19.50-20.25; mixed clippings, 19.25-19.50; old sheets, 17.75-18.00, old cast, 17.75-18.00; clean old cable (free of steel), 19.50-20.50; borings and turnings, 17.25-19.00

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 62.00; light scrap, 57.00; turnings and borings, 42.00.

Copper and Brass: No. 1 heavy copper and wire, 35.00; No. 2 heavy copper and wire, 33.50; light copper, 31.00; refinery brass (60% copper) per dry copper content, 31.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 35.00; No. 2 heavy copper and wire, 33.50; light copper, 31.00; No. 1 composition borings, 29.00; No. 1 composition solids, 29.50; heavy yellow brass solids, 20.00; yellow brass turnings, 19.00; radiators, 23.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 58.29; oval, 57.54, 5000-10,000 lb; electrodeposited, 50.28; 2000-5000 lb lots; cast, 52.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 10-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. Prices eastern delivery.

Tin: Bar or slab, less than 200 lb, 117.50; 200-499 lb, 116.00; 500-999 lb, 115.50; 1000 lb or more, 115.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 30.25, over 10,000 lb, 29.50.

Copper Cyanide: 100-1000 lb, 80.50.

Copper Sulphate: 500-1900 lb, 21.15; 2000 lb and over, 18.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.5; 10,000 lb and over, 38.50; prices eastern delivery.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25; prices eastern delivery.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 70.90; 100-600 lb, 62.50; 700-1900 lb, 60.00; 2000-9900 lb, 58.30; 10,000 lb or more, 57.10.

Stannous Chloride (anhydrous): Less than 25 lb, 167.70; 25 lb, 132.70; 100 lb, 117.70; 400 lb, 115.30; 5200-19,600 lb, 103.10; 20,000 lb, 90.90.

Stannous Sulphate: Less than 50 lb, 130.40; 50 lb, 100.40; 100-1900 lb, 98.40; 2000 lb or more, 96.40.

Zinc Cyanide: Under 1000 lb, 55.55; 1000 lb and over, 53.55.

(*Concluded from page 159*)

attracted slightly higher prices.

Boston—Prices on No. 1 heavy melting steel, bundles and busheling are up slightly more than $6 a ton. This gain puts brokers' buying prices, shipping point, at the highest level they have hit this year. In two weeks, prices have increased more than $10 a ton. Strength is primarily on district mill and export buying. While other steel grades are stronger, prices on them have not risen as sharply as they have on heavy melting steel. The usual range of differentials between the grades has been knocked for a loop.

New York — Brokers' buying prices are up $1 on most grades, reflecting a scarcity of material and a continued strong market undertone. They are paying $48-$49 for No. 1 heavy melting and No. 1 bundles; $39-$40 for No. 2 heavy melting; and $36-$38 for No. 2 bundles. Prices on machine shop turnings and mixed borings and turnings have been boosted to $28-

(*Please turn to page 166*)

CLASSIFIED ADVERTISING

LUBRICATION ENGINEER

Southern California concern operating a large variety of heavy machinery and mobile equipment has technical staff position open for qualified man with mechanical or chemical engineering degree, or equivalent. Must be able to prescribe correct lubricants and lubricating methods, write specifications and schedules, oversee lubricating costs and standards in wide range of usage. State experience, age, training, etc.

WRITE BOX 442, STEEL

Penton Bldg. Cleveland 13, Ohio

PLANT CONSTRUCTION

Openings For:—

JUNIOR & SENIOR ENGINEERS

With Steel Plant or Construction experience to inspect construction of integrated steel plant in South America. Contracts & Profit Sharing. Submit resume, expected salary. All replies held in confidence

Box 445, STEEL

Penton Bldg. Cleveland 13, Ohio

ENGINEER WANTED

ENGINEERS, DESIGNERS AND CHECKERS WHO ARE QUALIFIED PERSONNEL WITH EXPERIENCE IN DESIGNING AND BUILDING HEAVY MACHINERY. OFFICES LOCATED IN MID-WEST. EXCELLENT OPPORTUNITIES DUE TO BACKLOG OF ORDERS.

REPLY BOX 447, STEEL
PENTON BLDG., CLEVELAND 13, OHIO

WANTED
FORGING PLANT
LARGE STRUCTURAL SHOP

Write Box 449, STEEL

Penton Bldg. Cleveland 13, Ohio

SPECIAL S & S SELECTION

From Stock Of 2500 Machine Tools

2⅝" 6 spdl Cone. In use 6 mos.
3¾" New Hor Boring Mill w/built-in rot table.
8" Barrett Hor Boring Mill now in op.
10" x 120" Landis Cyl grinder, 1943
16" x 120" Landis Cyl grinder, 1943
#2 & #3 Cinc. Filmatic cntrless grndrs
8" x 18" Cinc. Vert Mill & Die Sinkr, comp '53

#4D&5D Potter & Johnson turret lathe '43
P&W Miller & Die Sinker 18" x 72" Table
#D1 Becker Miller & Die Sinker, 20" x 110" tbl

PLANERS: 120"x60"x22' D&H opnside 72"x60"x24' D&H opnside hvy dty wrm drv 3 motor drive, rapid traverse box tbl—pendant control
2—62"x62"x20' Niles heavy duty 28" Cinc. 2 spdl Hydrotel Profiler—1942

12' #3 H&J Pyramid Roll, drp end 2 mtr drive
13' Southwark Initial Roll, open end.
10'-½" cap Cinc. brake, 1952

S&S MACHINERY CO.

140 53 St.
Bklyn 32, N.Y.
HYacinth 2-7400—Cable: Sandstools.

FOR SALE

MINSTA 2000 TON HYDRAULIC FORGING PRESS, bed 5' LR x 50" FR. Daylight 111" 56" stroke. Fully equipped. 4 column type, 17" columns. Now setup in Navy plant. Recently rebuilt. Price $22,500.

EVEREADY; P. O. BOX #488, BRIDGEPORT, CONN.
EDison 4-9471

FOR SALE

Over 400 tons ¼" carbon steel plate in stock. Immediate delivery on tanks 5,000 to 10,000 gallon capacity, or fabricated work.

THE HILYARD COMPANY
P. O. Box 70
Norristown, Pa.

$29, short shovel turnings to $33-$34. Low phos is higher at $50-$52; No. 1 cupola at $45-$46; and unstripped motor blocks at $35-$36. Heavy breakable cast is unchanged.

Buffalo—Scrap prices are up about $5 a ton here. Advances reflect strength in other markets within shipping distance of Buffalo and sharply higher prices on new industrial lists here. No new mill orders are reported at the higher levels, but brokers and dealers are talking in terms of $50 for No. 1 and $40 for No. 2. The cast grades appear fairly well stabilized following a purchase of cupola grade at $45.

Cincinnati — After jumping sharply a week ago, scrap prices have settled down, leveling out at $52.50-$53.50 for No. 1 heavy melting. Brokers think the present level will hold for several weeks because increases have stimulated the flow of material to dealers' yards. Upward adjustments include $2 to $54-$55 on No. 1 railroad heavy melting; $1 to $70.50-$71.50 on rails, 18-in. and under; $1 to $62-$63 on rails, random lengths; $1 to $56-$57 on drop broken machinery cast.

Birmingham—The scrap market is strong here, with prices up $1 to $5 a ton. The biggest increase is on electric furnace bundles. During the strike, much of the scrap in local dealers' yards was moved to northern consuming points or was exported. Dealers now say material is coming in slowly.

Exporters are paying $51 for No. 1 heavy melting. Some dealers have been offered more. This is $8 a ton more than was paid this week by domestic mills, f.o.b. Birmingham. Specialty items and cast grades are in demand at higher prices.

Los Angeles — Concern is expressed here over shipments of scrap to the Orient. Kaiser Steel Corp.'s three blast furnaces at Fontana, Calif., are easing the strain on scrap. The firm is shipping 50,000 tons of 45 per cent iron ore and 10,000 tons of pig iron to Japan monthly.

San Francisco—Steel scrap prices haven't gone up here, but a rise is expected. That's the outlook as mills resume operations after the strike. There's no glut of scrap here. Shipments, lightened by the strike, were easily absorbed in the export market and by the one mill that operated throughout the strike.

Seattle—The immediate trend of the scrap market here probably will not be indicated until larger consumers resume buying. Mill inventories are reported to be substantial.

Iron Ore . . .

Iron Ore Prices, Page 156

Only 280,202 gross tons of iron ore were brought down from the head of the lakes in the week ended Aug. 6, reports the Lake Superior Iron Ore Association. This compares with a normal weekly movement in August of more than 3 million tons. About 80 per cent of the lake fleet did not operate during the steel strike.

Because of the lost tonnage during July and early August, cumulative shipments in the 1956 season to Aug. 3 were only 34,017,576 tons, against 43,660,865 in the like period last year.

Where floor space is a problem — or where stacking and paralleling is indicated — the new Miller SRH LOWBOY is the engineered-to-your-needs answer! This dc rectifier type welder is available in three models with 60% duty cycle ratings of 200, 300 and 400 amperes. Combining compactness with quiet operation, minimum arc blow, top electrical efficiency and waterproof construction, the LOWBOY is another Miller first that "figures."

Upright 5R models to 600 amperes at 40 volts with 750 amperes maximum output; Duplex units up to 1200 amperes, 40 volts, 1500 amperes maximum.

". . . if it's MILLER you know it's the finest . . ."

New

MILLER ARCWELD welding electrodes are worthy of the MILLER name and reputation. Ask your distributor for some . . . you'll like the job they do.

miller
ELECTRIC MANUFACTURING CO., INC.
APPLETON, WISCONSIN
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QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

WARD STEEL CO.

We specialize in FINISHED STEEL BARS—TUBES—STRIP

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of

BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

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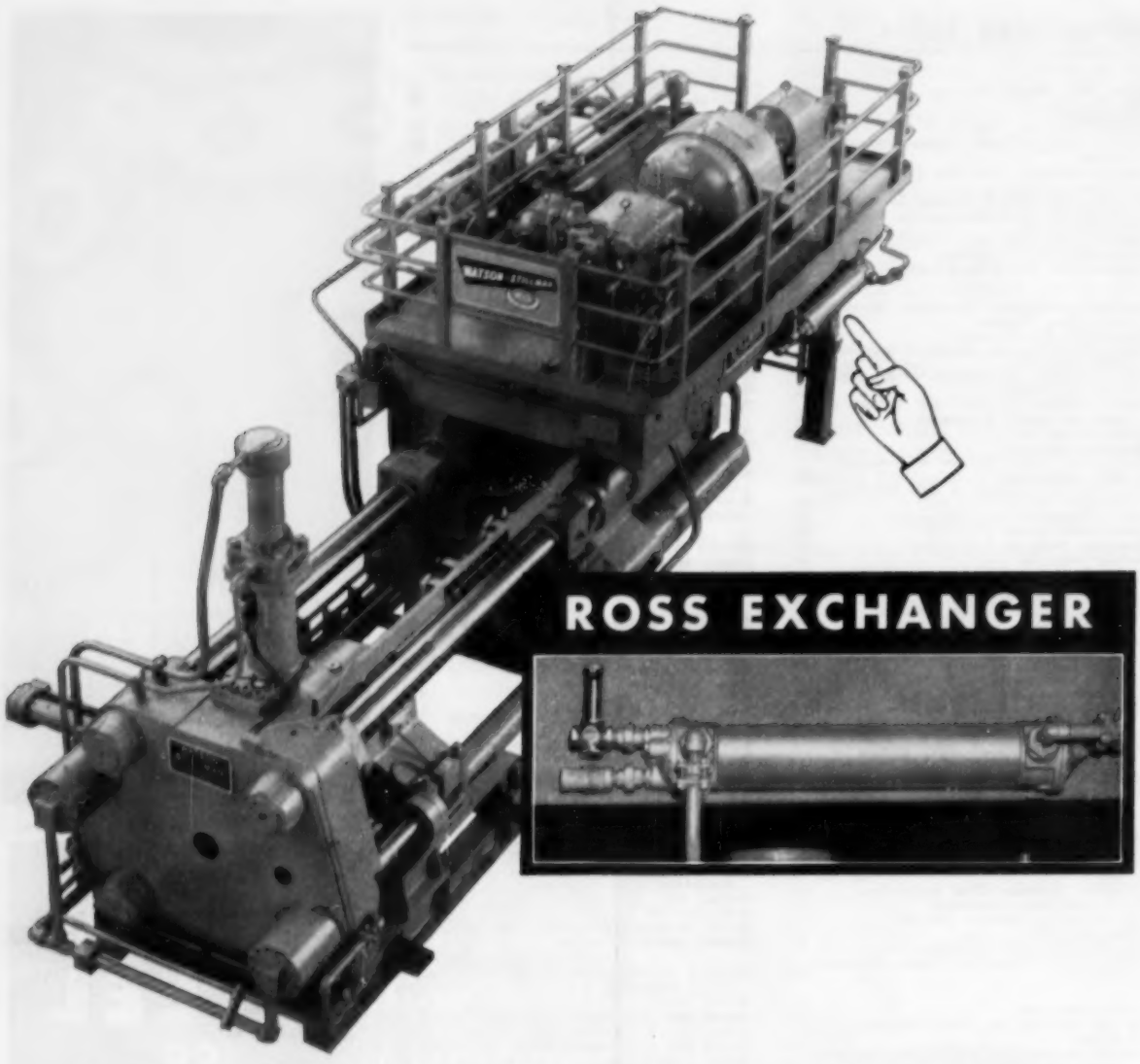
CAMBRIDGE 40, MASS.

Branch

3042-3058 W. 51st Street, CHICAGO, ILL.

Phone: Grovehill 6-2600



insures full hydraulic power for all motions of this 1700-Ton Watson-Stillman Extruder

When this 1700-ton Watson-Stillman Aluminum Extrusion Press goes into action, the hydraulic system powering its every motion is safeguarded in a most dependable way: Neatly-mounted next to the pumping unit, a Ross Type BCF Exchanger maintains correct oil temperature at all times. Oil viscosity won't break down to cause pump slippage.

Furnished as standard components of numerous types and makes of hydraulic machinery, Ross Exchangers are unexcelled for thermal efficiency and ruggedness. Compact in design and easy to install, they're pre-engineered, fully standardized and available in wide range of sizes to fit your needs.

For detailed information, request Bulletin 1.1K5. Ross Heat Exchanger Division of American-Standard, Buffalo 5, N.Y. In Canada: American-Standard Products (Canada) Limited, Toronto 5, Ont.

ROSS

ROSS HEAT EXCHANGER PRODUCTS

The handwriting is on the wall . . .

Eventually all major annealing departments will be composed entirely of Single Stack Furnaces

. . . And most of them will be made by

Lee Wilson ENGINEERING COMPANY, INC.

[illegible] WEST LAKE ROAD • CLEVELAND 16, OHIO

SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

* ORIGINATORS AND LEADING PRODUCERS OF SINGLE-STACK RADIANT TUBE FURNACES

10041

Speeds materials handling 30% to 40%

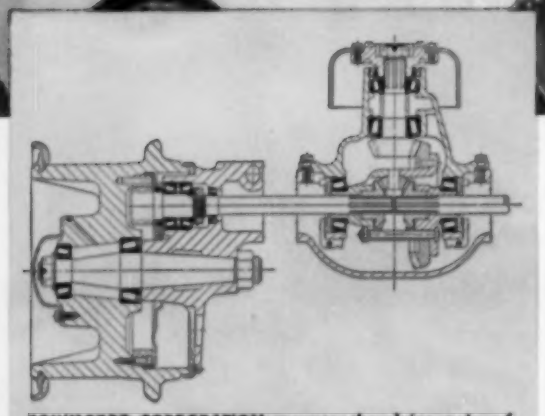
...on TIMKEN® bearings

THIS Towmotor Model 460, known as "The One-Man Gang" in the automotive industry where every minute counts in meeting tight production schedules, cuts materials handling time up to 40%. And Timken® tapered roller bearings "roll the load" in steering kingpin, steering wheel, drive wheel, jack shaft, differential gear shaft and pinion—keep the Model 460 on the go.

Highly maneuverable, the Towmotor 460 must make countless starts and stops—putting heavy load on the pinion. Timken bearings keep the gears in accurate alignment despite these heavy changing loads. The tapered construction of Timken bearings lets them take radial and thrust loads in any combination. And full line contact between Timken bearing rollers and races gives them extra load-carrying capacity. No extra thrust devices are needed. Simpler, more trouble-free designs are possible.

Maintenance costs are reduced, with Timken bearings practically eliminating friction. Geometrically designed and precision-manufactured to give *true rolling motion*, Timken bearings meet rigid quality controls every step of the way. We even make our own steel, which no other American bearing maker does. Timken bearings make all kinds of machinery run better, last longer. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



TOWMOTOR CORPORATION mounts the drive axle of its Model 460 lift truck on Timken tapered roller bearings to speed materials handling.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

ROLL THE LOAD